

# THE IRON AGE

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## Developments in Brass Melting—I\*

The Now Ancient Methods Giving Way to the Electric Furnace—The Large Commercial Application of the Bridgeport Brass Co.

BY OTIS ALLEN KENYON

OF all the present day industrial arts that have come down to us from the ancients there is none that has changed less in the technique of its practice than brass melting. The early history of brass is much beclouded on account of the fact that writers often confused it with bronze and other copper alloys. We do know, however, that brass making was known in prehistoric times because many specimens have been found in ancient ruins.

Many of the earliest writers mentioned brass, but not in terms certain enough to preclude its confusion with bronze. The first unmistakable reference in literature to brass was made by Dioscorides in the first century after Christ, and from then on there is no contribution to the literature of brass making until the thirteenth century, when Theophilus described the calcining of calamine (zinc ore) and its mixture with finely divided copper in glowing crucibles.

The melting and casting of the metal in a brass mill is the most important step in the whole process of making brass materials, because any failure here cannot be rectified by later manipulation. However, in spite of the vital character of this stage it is the one in which the least advancement has been made.

\*This article will appear in three parts. Subsequent articles will deal with the manufacture of sheet brass and brass tubes, rods and wire.

Practically all mills that produce brass for rolling into sheets or rods, or drawing into wire or tubes, employ the crucible in the coal-fired pit furnace, which is, basically, the same method as that which was used in the middle ages.

Referring to Fig. 1, which is reproduced from a drawing made in 1672, it is seen that the three main elements of the ancient casting shop (furnace, crucible and mold) bear a truly remarkable resemblance to the corresponding elements in the casting shop of some of the largest brass mills of to-day.

During the same period wonderful advances have been made by brass makers in the mechanical working of brass, so that it cannot be said that the practice of casting has remained stationary because brass makers have not tried to improve it. They have tried, and up to very recently it seemed as though it simply couldn't be done. The process was in the hands of the skilled workmen, and each master caster guarded his secrets well.

In order to prove the statements just made with regard to the similarity of the ancient methods of brass casting and the modern ones, the operation of a modern pit furnace plant will now be briefly described.

### The Casting Plant in Brass Making

The casting plant of the modern brass sheet, rod,



Fig. 1.—Brass Foundry as Illustrated in Ecker's "Unterirdische Hofhaltung." Published in 1672. The literal translation of the reference letters is as follows: A—interior view of a brass furnace, showing the arrangement of the crucibles and how they are set in place. B—furnace in action. C—crucible. D—shovel for the calamine. E—pair of tongs for handling the crucibles. F—draft opening of the furnace. G—mold made of British stone. H—represents the master caster.

According to description given by the author, calamine and fine coal were mixed together, with water and salt. The crucibles were heated and 46 lb. of calamine mixture were divided among eight crucibles, then 8 lb. of conner were placed in each crucible. After 9 hr. in the fire the mixture was well stirred, allowed to stand for an hour and then poured. The process here described is substantially the same as revealed by Theophilus four centuries previously.

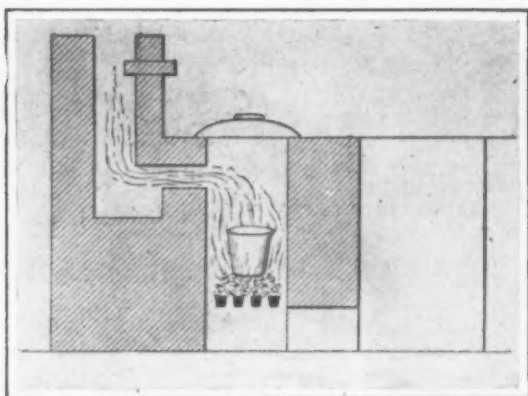


Fig. 2.—Cross-section of a Typical Pit Furnace

wire and tube mill consists of the following main elements:

1. Furnaces.
2. Crucibles.
3. Molds.

The furnaces are almost without exception of the square, natural-draft pit type and usually employ anthracite coal for fuel. Fig. 2 shows a typical cross-section of such a furnace. Ordinarily ten to fifteen furnaces are grouped on a single flue, each flue leading to a chimney.

It should be noted that the principal difference between this furnace and the furnaces used in the Middle Ages is that the gases of combustion are carried off at the side, while in the ancient furnaces they were allowed to pass up through the top and into the casting room. Then, too, the old furnaces were made large enough to hold a number of crucibles, usually eight (see Fig. 3), while nowadays there is one furnace for each crucible. The modern

practice is to use anthracite coal in most instances, although coke and charcoal are also used quite extensively. In ancient times charcoal or wood was the fuel.

The crucibles, which are ordinarily made of clay and graphite, usually have a capacity of from 160 to 300 lb. of metal. They require great care in handling in order to obtain a satisfactory life, and for this reason and others they constitute one of the weakest elements in the casting shop. Ordinarily the life of a crucible is 25 to 35 heats, depending upon the manner in which it is handled, and some casters by virtue of special practices get even longer life out of their crucibles. Comparing modern crucibles with those used in the Middle Ages, it is difficult to see any appreciable difference.

The modern mold is made of soft, gray iron, hand finished. Metal intended for sheet brass is cast in wide, flat bars, while metal for rods and wire is cast in cylindrical billets. Metal for tubes is cast either in solid or hollow cylindrical billets, depending upon the process employed. In ancient times stone was used for molds.

#### The Casting Operation

Casting in this type of plant is entirely up to the boss caster. He, with his one or more assistants, controls the fires, charges the crucibles, stirs and skims the metal, prepares and pours the molds. The whole process from start to finish is up to him, and he is usually paid on the basis of the output of good metal he attains.

The eight or twelve fires under the charge of one boss are all started at one time. The crucibles are warmed carefully before charging with scrap and copper ingot. If the crucibles are not carefully dried out and gradually brought up to heat, they

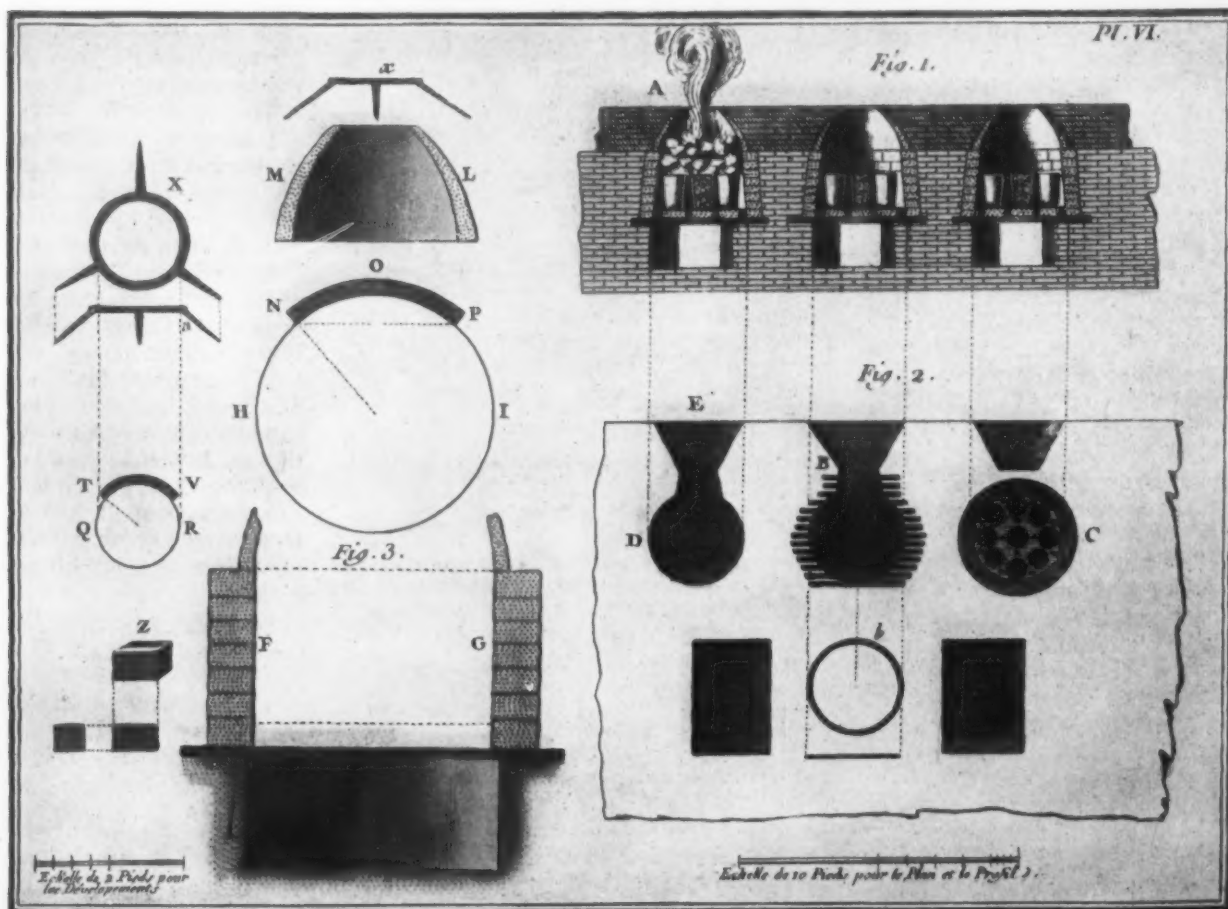


Fig. 3.—Brass Melting Furnace Construction as Illustrated in a Paper by Galon Before the Académie Royale des Sciences, 1764. The principal difference between these furnaces and the modern pit furnace is the method of taking care of the gases of combustion. Here they were allowed to pass on through the top of the furnace into the casting shop, where they were caught under a large apron which led them into a common flue



will flake off and crack, and their life will be materially shortened.

The charging of the crucibles must also be made with care. For instance, if the crucible does not set firmly or evenly on the bottom, it will be subjected to undue strain and is even liable to tip over. Then, too, the charge itself must be so placed in the crucible that it will not become wedged and cause excessive strain against the sides when it expands before melting. All these points and many more require the constant and keen attention of the boss caster and his assistants.

As the copper begins to melt, a handful of salt is added and stirred in to remove the copper oxide, and then the surface of the metal is covered with a layer of charcoal to protect it from the action of the furnace gases or the air.

After the charge is completely melted and the temperature raised to the proper point, the zinc or spelter is added. This temperature may be gaged by the expert caster through the medium of his stirring rod. His sense of touch is so trained that he can perceive the vibration due to the boiling of the zinc in the scrap, which signifies that it is time to add the spelter.

The spelter, being lighter than the copper, will float to the top and finally oxidize and waste away unless it is thoroughly stirred in and the surface protected with a layer of charcoal or some suitable flux. In Fig. 4 is a view of a modern casting shop, showing a line of pit furnaces. The casters are stirring in the spelter. In the upper right-hand corner of the photograph may be seen the hoisting apparatus that is used for lifting the crucible out of the furnace and manipulating it, as will hereafter be described.

Fig. 4 (at upper left).—A Line of Pit Furnaces in a Modern Casting Shop. The men here shown are stirring the metal, and fine coal used for laying the fires is stored in bunkers located directly over the furnace openings. Empty crucibles and half crucibles may be seen at various points along the tops of the furnaces. A hoist is used for raising the crucibles and manipulating them during the process of skimming and pouring.

Fig. 5 (in circle).—Skimming a Crucible. The tongs with which the crucible has been lifted from the furnace are used by the boss caster to manipulate it during the entire operation of skimming and pouring. To protect the rope from the heat and gases, a rod link connects the block to the tongs. These tongs should be compared with those shown in Fig. 1, as there is practically no difference in the construction.

Fig. 6 (at upper right).—The Boss Caster Is Manipulating the Stream and Holding Back the Dross with His Skimmer Iron, While He Pours with the Tongs. Attention is called to the great similarity between the molds here shown and the one shown in Fig. 1. It will be seen that the method of clamping the parts together is practically the same in both cases.

Fig. 7.—Pouring the Second Mold from a Crucible. This illustration shows plainly the rod and rope by means of which the assistant manipulates the jib crane for hoisting and maneuvering the crucible during the skimming and pouring operations.

After the introduction of the spelter the crucible must remain in the fire long enough to overcome the chilling effect produced by the introduction of the spelter before pouring. If the crucible remains too long in the fire the metal will be overheated and an undue loss of zinc produced, while if it is poured too soon before the temperature has attained its proper value, the casting will not be good.

The caster often judges the pouring temperature through the medium of his stirring rod. His sense of touch is so trained that he can perceive the vibration, due to the boiling of the zinc, which signifies that it is time to pour.

Since all the fires are started at the same time it naturally follows that all the various operations occur at approximately the same time. Consequently it requires ex-

traordinary skill on the part of the boss caster to manipulate the fires in such a way that each crucible will be poured as nearly as possible at the time it is ready.

The metal being considered ready for pouring, the coal is poked away from the crucible with an iron bar and the tongs with which the crucible is manipulated inserted and clamped. With a block and tackle fastened to a light jib crane, shown in Fig. 4, the helper hoists the crucible out of the furnace and swings it to a position on the cast iron floor as shown in Fig. 5, where the boss caster with a skimming rod removes the dross. This photograph is an excellent illustration of the volatilization of the zinc which is going off in a white cloud because of the removal of the charcoal covering. Incidentally, this picture shows why casters often suffer from "spelters' shakes" which is a mild form



of poisoning by the inhalation of zinc oxide fumes.

The helper who manipulates the crane does so with the aid of a rope and a rod. The rope serves to hoist the crucible, while the rod, in addition to offsetting the side pull of the rope, enables the operator to push and pull the trolley and jib to any desired position, thus giving him complete control over the manipulation of the crucible. The caster has simply to tilt the crucible. This method of hoisting has been used for more than fifty years without appreciable change, although various unsuccessful attempts to replace it have been made. Its advantage is quick action.

As soon as the crucible is skimmed it is hoisted and swung into position for pouring, as shown in Figs. 6 and 7. The pouring itself requires great skill, as the perfection of the casting depends to a very large extent upon the manner of pouring. As is seen in the illustrations, the caster rests the edge of the crucible on the mouth of the mold, and as he tips the crucible he holds back any dross or char-

coal with a skimmer iron, and at the same time he often uses the skimmer iron to divide the stream into two parts, in this way greatly improving the chances for a perfect casting, especially where wide bars are concerned.

Previous to using, the molds are coated with a high-grade lard oil, which serves a two-fold purpose, namely: it prevents the metal from acting upon the iron, and in burning at the mouth of the mold it envelops the stream in a reducing atmosphere, which decreases possibility of oxidation.

The molds are slightly inclined so as to make it easier for the caster to pour the metal, thus preventing it from striking against the sides of the mold. If the metal strikes continuously in one spot the casting will be porous on that side.

No attempt has been made here to cover the almost infinite number of fine points involved in the art of brass casting as practiced by the best men in the industry. In fact, the subject has never been reduced to an exact science.

## RAILROAD BILL

### Strong Opposition to Conference Agreement, But It Will Probably Be Adopted

WASHINGTON, Feb. 17.—Formidable opposition to the approval of the conference report on the railroad bill has developed in Congress, but the general belief is that the report will be approved and legislation enacted before March 1, when the railroads go back to private control. The conference report has been entirely completed and will come up for consideration in the House within the next few days.

Two of the House conferees, Representatives Sims of Tennessee, and Barkley of Kentucky, both Democrats, have refused to sign the conference report. This does not mean that the question has been made a party issue, because some Republicans as well as Democrats are opposed to the bill while a considerable number of Democrats are counted on to support it. Representative Sims always has been an advocate of Government ownership and has sought a two years' extension of Government control of railroads. He is expected to base his fight in this particular instance on the inclusion of section 6 relating to rate making of the Senate bill in the compromise measure. Representative Barkley is anxious for the enactment of legislation and does not favor Government ownership. The only part of the compromise measure to which he objects is section 6. Section 6 provides that the Interstate Commerce Commission shall adjust rates with the view of maintaining the average earnings of 5½ per cent by groups of roads on the net investment. It also provides for the division of excess earnings over 6 per cent between the Government and the roads earning them. The House members who object to this section oppose any fixed guaranty and believe that if there is to be any such principle as this incorporated in the bill, authority to fix the percentage should be vested in the Interstate Commerce Commission.

The compromise bill continues the 5½ percentage for two years, after which the commission is given authority to revise it.

Organized labor also has opened fire on the conference report and with the aid of those objecting to section 6 hopes to succeed in bringing about its defeat. The weekly publication of the Plumb Plan League denounces the entire bill as one which is satisfactory to Wall Street, stating that the bill validates \$8,000,000,000 of watered stock and that it insures an increase of freight rates of at least 25 per cent. The compromise provision for the adjustment of labor disputes is described as "crudely drawn and as manifestly unfair to labor and that it will add to our industrial difficulties instead of decreasing them." It is charged that "no more colossal fraud was ever perpetrated."

A hard fight is assured in the House and possibly

in the Senate also. Senator Cummins and Representative Esch and others, however, believe that when members of Congress are confronted with the alternative of approving this conference report or failing to enact any legislation, the majority will rally to its support.

O. F. S

### To Make Steel Sash Equipment at Chester

A new company to manufacture a complete line of steel sash and sash-operating devices has been organized by T. W. Allison of Allison & Co., Chester, Pa., John J. McClure, Edwin D. Glauser and Kingsley Montgomery, to be known as the Allison Steel Products Co. A three-acre site at Second and Palmer streets, Chester, has been secured for a new plant, which it is contemplated will have an output of \$1,000,000 worth the first year. The first unit will be 62x202 ft., of steel with sash and sash-operating equipment of the company's own make. Contract has been awarded the Chester Construction Co. for the initial building to cost about \$70,000. There will be six units in all. Contract has also been let for \$30,000 worth of machine tools and other equipment. Plans are to begin operations in about 60 days.

The officers of the new corporation are: T. W. Allison, president; E. D. Glauser, vice-president; John J. McClure, treasurer; Kingsley Montgomery, assistant treasurer and secretary. William Roper, general superintendent, long a prominent figure in the sash manufacturing industry, has evolved a line of sash operating devices for the company.

### Manufacturer Forms Export Company

The Walworth International Co., a subsidiary recently formed by the Walworth Mfg. Co., Boston, to handle the export trade, is located temporarily at 39 Broadway, New York. The new company will also represent nine associated companies in the export markets, taking over the established foreign offices of the Walworth Mfg. Co. in London, Paris, Johannesburg, Sidney, Bremen, Buenos Aires, Havana and Santiago. Officers of the International company are: W. Ayer, president, and Alfred J. Eichler, vice-president and general manager. The New York sales manager is Charles Keefe and engineer J. L. Barry.

The Associated Foundries of Cincinnati held their annual meeting and dinner at the Business Men's Club on Feb. 12. The following officers were elected for the coming year: President, D. C. Jones, Lunkenheimer Co.; vice-president, Neil C. Lamont, Worthington Pump & Machinery Co.; secretary, George F. Dana, Peerless Foundry Co.; treasurer, H. A. Lammers, Cincinnati Steel Castings Co. A. H. Walstad of the Walstad Machine Co., Tacoma, Wash., gave a talk on industrial



# President Irons Discusses Labor Problems\*

Profit Sharing, Unions, Employee Representation and Other Factors Considered — Why the Steel Strike Failed — The Reactionary Employer and the Unreasonable Employee

— BY ROBERT H. IRONS† —

**A**FTER years of study and very intimate contact with the labor problem, I am fully convinced that so long as one man profits by another man's labor, and so long as corporate greed and personal integrity are not equal in all men, just so long will the question remain unsolved.

If we can forecast the future by the past, one is led to believe that by a process of evolution in all probability some method will be found to bring about a more equitable distribution of the profits arising from invested capital and the people employed.

To the unthinking the method of profit-sharing suggests itself. Any plan of this kind fails unless it provides that labor share the losses as well as the profits. The many and wide fluctuations in the business of any industrial nation would penalize labor unnecessarily if placed on a profit-sharing basis that would be fair to both invested capital and labor.

The profits that might accrue during good times would be regarded as part of the wages of the employee and increases in wages that might otherwise be given would not materialize.

In quiet times, when trade is dull, the disappearance of profits would automatically reduce the wages of the employees without further justification than the mere fact that the business was not profitable. As a general proposition, any industry or company that can not or will not pay living wages does not justify its existence and should close down and go out of business. Usually more strikes and lockouts occur in a locality or in an industry where keen competition or the geographical location is such that it is impossible to pay good wages.

Profits should not be considered together with wage rates, as the lack of the former, while unfortunate, is no fault of labor, and as living costs increase the wage earners must receive a proportionate increase and, if this is impossible, the country would be far better off as a whole if that particular industry closed down and the workmen compelled to go to more profitable employment.

## Labor Unions

Public opinion is thoroughly aroused over labor union arrogance and tyranny, the storm clouds are gathering and the unscrupulous labor leaders are looking for shelter in the cyclone cellar of oblivion. All unions are not bad and all labor leaders not radicals, but unfortunately the public will not discriminate and injustice and punishment will be inflicted where not merited. Some of our craft unions resemble the guilds of medieval times and take pride in their work, the excellence of their workmanship, and to be eligible for membership requires proper apprenticeship before obtaining a journeyman's union card. Unfortunately unions of this kind are being brushed rudely to one side and radical labor leaders filled with the arguments of Karl Marx are openly advocating syndicalism, sabotage, direct action, one big union, and have gone to the length of attacking our form of government.

Time will not permit specific reference to the various forms of this mania except to say that the Communist, the Anarchist, the Bolshevik, the Socialist, the parlor political economist, the 50-50 American and all those not loyal to country, flag and our form of government will soon discover that aroused public opinion against syndicalism is a more potent force than rattle-brained argument and theoretical nonsense.

Many of us were provoked during the war by the tolerant attitude of the Government toward labor leaders and the unions. From the newspapers we learned that efforts were made by the Department of Labor and the War Labor Board to unionize the workers under very thinly veiled suggestions for the appointment of shop committees; that the effort was carried to the length of having some labor organizers exempted from the Army draft on account of being engaged in a necessary occupation.

A very charitable view of this condition would be that these departments of the Government had an exaggerated idea of the importance of union labor and in their anxiety for production went too far. My solemn resolve to avoid statistics prevents me from mentioning the small portion of our total population that is affiliated with labor unions.

Any feeling we may have had regarding the tolerant attitude of the Government is now wiped away by the splendid work being done by the Department of Justice and the Labor Department in connection with the deportation of the radicals.

## Workmen Commended

I will take this opportunity to commend the workmen of the entire district of Harrisburg. The men, regardless of union affiliations, were loyal, patriotic, stuck to the job, got out production and did not find it necessary to pass resolutions protesting their patriotism and loyalty to the Government.

It is most important to differentiate between opposition to labor unions as a whole as compared with objection to some of the things they stand for. It is un-American to say that a man shall not join a labor union. A man has as much right to join a labor union as he has to join a church, beneficial order, club or association of any kind, just as much as the employer has to join a manufacturers' association or the chamber of commerce.

## Collective Bargaining

There is nothing inherently wrong with collective bargaining. If an employer could bargain and finally contract for his labor and place any reliance on the contract being fulfilled, I have no doubt that a majority of employers would prefer this arrangement. While repudiation of contracts is not entirely confined to labor unions, yet as a general proposition many labor union executives, responsible for labor contracts, have a very elastic code of ethics.

Frequently a demand for higher pay or shorter hours is made subsequent to a contract for labor having been signed prior to an important sale of a ship, bridge or some other large undertaking. Usually the repudiation of the labor contract comes at the most critical time and the company, perhaps under a penalty to complete the undertaking, is confronted with heavy loss if a compromise is not made with the labor representatives.

## Different Kinds of Employers

We have had so much to say about labor unions that our attention should now be directed to the employer. The same wide difference is found among the employers as is found among labor leaders.

The subject is so big and one is so limited by time and the forbearance of the members of this club that by a process of elimination we will not consider the big broad-gage business man, who is tolerant of labor unions, kind and considerate to his employees, and with a vision of the future is always on the lookout to im-

\*From an address before the University Club, Harrisburg, Feb. 7.

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prove their condition as his economic situation may permit. We will also eliminate the heads of some of our craft unions, who are considerate of the rights of others, have due regard to the sanctity of a contract and are men of a high type and unquestioned integrity.

Our attention will be confined to the stubborn reactionary employer, who discharges men for merely identifying themselves with a labor union, and has no regard for the living conditions and the relation of the wages paid to the cost of living; and is jointly responsible in a large measure with the radical labor leaders for the bitter controversy being constantly waged between corporate interests and organized labor.

This type of employer and the class of labor leaders mentioned can best be described as the Sinn Feiners of American industry. A translation of the Irish Gaelic words Sinn Fein, standing as they do for the radical element in Ireland, would be "We ourselves" or, perhaps a better translation, "Ourselves alone."

The steel industry recently expended \$300,000,000 and the workmen lost \$50,000,000 in wages over the question of a closed shop in this industry. There could be only one conclusion to the controversy, and if thrice the money and time had been taken, the end would have justified the means. The industrial life of our nation was at stake and our democratic form of government was attacked.

What broke the strike?—The right thinking, upstanding, two-fisted American workman, who, when fully informed as to the character of the birds of ill fame leading the strike, promptly packed his bucket and in many cases risked his life and went back to work.

#### The Closed Shop

Perhaps a word in explanation of the significance of the closed shop might be in order. It means that no workman can be employed in a certain industry or company without first joining the craft unions under which the plant may be operating. It also means that the worker has no choice in the matter, that he does not enjoy the full freedom of American citizenship and that he is entirely at the mercy of perhaps an unscrupulous walking delegate. It means that, if the company braves the displeasure of the labor bandit, a sympathy strike will be called to compel the company to discharge the man not possessing that necessary badge of servitude—a union card.

A very large proportion of the workmen in this country have not and will not become identified or affiliated with a labor organization on account of their inherent independence, their desire for freedom of action and, still more important, their wish to avoid identification with a certain class, as they realize fully this would preclude their advancement and promotion.

After the industrial history of this period has been written, it will be found that the winning of the steel strike and the establishment of the open shop as a principle of American industry will stand out as clearly and as distinctly as the Bloody Angle at Gettysburg stands for the high water mark of the Rebellion. The principle of the closed shop is un-American, unpatriotic, unbusinesslike and will not be tolerated by the majority of the people of this country who, in the final analysis, dictate all things for all men in a democratic form of government.

In addition to aroused public opinion, several elements may be mentioned to combat the principle of the closed shop, which, after all, is a form of syndicalism or revolutionary labor unionism. It must be understood, however, that syndicalism is bitterly opposed to the old-time craft unions which since their formation have discouraged the affiliation with any particular labor party.

The syndicalist not only aspires to direct control over all the industries, but endeavors to dictate and control matters which are political and have to do with the form of government.

Militant trade unionism and the principle of the closed shop became so obnoxious in Texas that in several cities open shop associations have been formed and are succeeding in restoring to these people the rights of American citizenship which, in a large meas-

ure, have been denied them. These associations are spreading rapidly, particularly in the South, and it is safe to predict they will be an important factor in bringing certain radical elements to their senses.

#### Emergency Engineer Corps

I have purposely avoided reference to pending labor legislation, to the coal strike inquiry and to the preliminary report which has been made by the National Industrial Conference now convened in Washington. I will, however, refer to a plan which originated in Germany and which is meeting with success. This plan is being considered by the National Industrial Conference. The organization is formed entirely of volunteers and is known as the Emergency Engineers Corps, their object being to maintain the railroads, power plants, water works and other public utilities necessary for the safety and welfare of the people. At the present time there are 30,000 men in this organization and the plan seems to be very effective and to meet with surprisingly little opposition from the conservative branch of organized labor. As a matter of fact, the only severe criticism of the plan seems to emanate from the anti-Government socialists, who claim that the volunteer Engineers Corps is a creature of the reactionary strike-breaking program.

#### Rockefeller Plan

Various plans have been suggested and are being tried, to establish committees of workmen as a point of contact between the worker and the management. The first plan of this kind, and possibly the best known, is the Rockefeller plan which followed the strikes in the coal mines owned by the Colorado Fuel & Iron Co., which, in turn, is or was controlled by the Rockefeller interests. Some of you will recall the rioting, bloodshed and bitterness surrounding this strike, and the plan evolved after the settlement of the strike was with the idea of avoiding a recurrence of such deplorable situations. The plan as finally developed not only covered the coal mines but the steel works as well and has been in operation for a number of years with some measure of success. The calling of the steel strike on Sept. 22 last was the most severe test that this plan had been subjected to and the entire industry was interested in watching its operation. During the steel strike the Colorado Fuel & Iron Co. was closed down, and during the coal strike the coal mines did not operate, so that you can draw conclusions as to the efficacy of this plan.

The International Harvester Co. has what is regarded a very good plan, but in turn has had a very severe strike during its operation. The Midvale Steel & Ordnance Co. has a very elaborate scheme of works councils, but was also seriously affected by the steel strike. In all probability 200 corporations in the country are trying different plans, but as they are still in the experimental stage, it is well to reserve opinion as to their worth.

As a general proposition it may be stated definitely that employees' representation is not a substitute for fair dealing and that no plan of employees' representation will serve for honesty and sincerity on the part of the employer in his relations with employees. If it were possible to segregate the greed and selfishness of the employer and the petty jealousy and suspicion of the committees, the operation of the various plans would be greatly simplified. It can be safely stated that at present the works representation plans are not an unalloyed blessing. It might not be amiss in this connection to state that all these plans are meeting with the bitter opposition of trade unions.

Advocates of plant representation, works councils and other similar plans claim they serve as a point of contact between the workers and the management. The so-called point of contact often results in a short circuit and blowout and is frequently a fertile field for trouble.

Just as a straight line is the shortest distance between two points, so is the point of contact simplified and made more effective by having the door leading to the office of the chief executive open at all times. This fact, together with a spirit of the square deal, will



bring about many equitable adjustments of grievances without the complicated machinery of organization.

If the average executive were as quick to detect the rumble of feet of a grievance committee over the office floor as he is to listen to some trivial complaint regarding his product, much misunderstanding and bitterness could be avoided.

It has been my experience that while men are unreasonable at times and unfair in their demands, yet frequently they have just cause for complaint and if given an immediate opportunity to air their troubles instead of allowing them to accumulate, differences will be forestalled and a real case of grouch and discontent avoided.

#### High Cost of Loafing

Frequent reference is made to the high cost of living, whereas the real trouble is the high cost of loafing. We are all trying to work less and spend more. It is difficult to avoid statistics, but reference must be made to drive home the above statement that while we have about 6,000,000 automobiles in the country we only have about 2,000,000 income tax payers.

The eight-hour day is desirable and I hope to see the entire country on this basis some day, but there must be a general economic adjustment in all the industrial nations to avoid penalizing one nation due to the failure of one or several countries failing to adjust their affairs to meet this situation. To pass legislation in our country compelling all industry to adopt the eight-hour day would mean that to avoid curtailed production we would be compelled to assume a more tolerant attitude toward immigration.

At the present time we could employ several million Japanese or Chinese coolies to do the rough work of the nation, as there is almost a famine of common labor. The situation is becoming worse by reason of the return of many foreigners to their native countries.

Certain working conditions such as the long turn in the steel industry are disapproved by organized labor and very properly so. All the questions in dispute will be adjusted equitably when the supply of labor is adequate and improved conditions in competing countries will permit of same without jeopardizing the industries affected.

Will the ship ride the storm or will we have a Soviet form of government and nationalization of industries? No—decidedly no, and not even the labor party now mentioned in certain quarters. They haven't even rocked the boat, and if she gets a bit to one side we will trim boat, have a Boston tea party of another kind and dump overboard a lot of extra freight being carried in the form of the human hyenas now barking at our heels. In these days of coal shortage it seems a waste of good fuel and ship space to transport them to Europe, but this is necessary as there is not available a road map to a certain quarter where the climatic conditions are not so favorable.

As for the labor party and the labor vote, again No, as 85 per cent of our workers are not members of labor unions and they, together with a large majority of union men, will not vote a labor ticket and will continue to be either Democrats or Republicans, depending upon geographical location and the best interests of the industries of their particular localities.

The people as a whole are weary of drivel and drives, and are resentful of some of the so-called social welfare work, particularly when the paternal attitude is taken. Some of the activities seem to be based on the assumption that workmen and their families do not possess ordinary intelligence and have no knowledge whatsoever of fundamental facts regarding health, sanitation and the ordinary conditions surrounding their lives. Let us be good citizens before good Samaritans, teach thrift instead of theory and forget all the isms but one—Americanism. Stop the talk about the "poor downtrodden workingman." He is not downtrodden and does not propose to be; he is too big, strong and independent for that; he does not court nor want your sympathy. What he needs is good advice and your help to make him appreciate his advantages and opportunities instead of wasting time in

self-pity and snarling at his failure to receive in many instances that to which he is not justly entitled.

Is the average man as good a citizen now as he was during the war? I doubt it. The reconstruction period is perhaps a better test of citizenship than the war period, as the urge of patriotism is not present and we are not fired with the same zeal for production in our desire for victory in the great conflict. Some might question the truth of this statement by pointing out the fact that while the boys were fighting our battles in France and were covered with glory and cooties for \$30 per month, and no eight-hour day with time and one-half for overtime, we had an anvil chorus over here, particularly around the shipyards, for more pay and shorter hours. They were clothed in \$10 silk shirts and covered with the prickly heat of discontent.

Well, what's the answer? Where will it all end and what is the remedy? The best anyone can do is to hazard a guess as to the outcome. The longer the association, and the more intimate the contact, the greater is my faith in the good, hard common sense of the average American workman and the stronger my belief and the greater my confidence that he will come out of this sea of theory, economic flub-dub, discontent and unrest, a better citizen, a better worker, with improved social conditions, and above all with a better idea of the rights of others, and that in the future he will be guided by a spirit of fair dealing and justice.

#### Dr. Moldenke on Fundamentals

At the January meeting of the New England Foundrymen's Association, held Feb. 11 at the Exchange Club, Boston, Dr. Richard Moldenke, Watchung, N. J., was the principal speaker.

In opening his address Dr. Moldenke stated that he felt he had thoroughly covered science as applied to foundry practice in the several times he previously had addressed the members of this association. He therefore decided to begin all over again, starting where he did 20 years ago. He assured those present that during the past 20 years science as applied to foundry practice has not changed, although many new phases of it had developed.

He said it was necessary that the foundryman should have first of all a knowledge of fundamentals of iron based on ultimate and radical analysis, which show how the elements in iron are grouped. "The three things necessary in successful foundry practice are good material, correct meltings and proper moldings." In speaking of the elements, he emphasized the importance of graphite content regulation, and subsequently gave interesting illustrations of effects that silicon, manganese, sulphur, etc., have in the wearing qualities, toughness, etc., of iron.

Dr. Moldenke stated that a high sulphur content was not generally believed so serious as formerly, but that proper regulation of sulphur is still one of the big problems of the foundryman to-day. He warned against scrap, saying that its sulphur content increased rapidly during the war. Hope was expressed that the time will come when foundrymen will buy scrap by specification as rigidly as pig iron.

In treating the subject of steel mixtures, he said he hoped definite progress will be made this summer in establishing standards, which will regulate the question of semi-steel. It was claimed that to-day there is no way to differentiate between castings having small steel scrap content and those having large.

The presence of oxygen in iron is one of the most serious problems of the foundrymen, according to Dr. Moldenke, who admitted that some people differ with him on this point. The things to be watched closely in fuel analysis were sulphur and ash. In treating with the question of fluxes, it was asserted that the real basis of most patented fluxes is fluorspar.

Later in the evening Col. H. H. Zornig, superintendent of foundry, Watertown Arsenal, told of his experiences in making pig iron from scrap in an electric furnace sufficiently good to make castings for jigs and fixtures, and making pig out of chips profitably, but in a small way, in an electric furnace.

## SUPPLIES OF FERROMANGANESE

## Output in 1919 Small—Needs and Available Supply—Low Record of Spiegeleisen

Production of ferromanganese by American makers in 1919 was 179,079 gross tons, according to the blast furnace reports of THE IRON AGE. This is a little more than 50 per cent of the record total made in 1918, but it is still considerably more than the output in 1912, 1913, 1914 and 1915.

The greatest decline has been in spiegeleisen, the 1919 output having been only 65,391 tons, according to the same data. This is less than the production for many years.

The following table gives the production of ferromanganese and spiegeleisen for the last quarter of 1919 and for the last eight years in gross tons:

Ferromanganese and Spiegeleisen Output in the United States in Gross Tons			
	Ferromanganese	Spiegeleisen	Total
To Oct. 1, 1919.....	137,241	51,309	188,550
October .....	15,164	5,074	20,238
November .....	15,464	4,500	19,964
December .....	11,210	4,508	15,718
Total, 1919.....	179,079	65,391	244,470
Total, 1918.....	345,306	249,002	594,308
Total, 1917.....	257,834	188,852	446,686
Total, 1916.....	208,389	197,518	405,807
Total, 1915.....	146,542	93,282	239,824
Total, 1914.....	106,083	100,365	206,448
Total, 1913.....	119,495	126,081	245,576
Total, 1912.....	125,378	119,506	244,884

The monthly average output of ferromanganese in 1919 was 14,923 tons, the lowest having been 11,210 tons in December. The January production this year was 18,062 tons. The average spiegeleisen output in 1919 was only 5449 tons per month with its lowest in November and December. The January output this year was 5895 tons.

## Available Supplies of Ferromanganese

The available ferromanganese supplies for 1919 are shown by the following analysis of output, imports and exports:

	Output	Imports	Exports	Available Supplies
To Oct. 1, 1919.....	137,241	18,649	2,048	153,842
October .....	15,164	4,025	934	18,255
November .....	15,464	6,921	79	22,306
December .....	11,201	3,427	3	14,625
Total, 1919.....	179,079	33,022	3,064	209,027
Aver. per mo., 1919.	14,923	2,752	255	17,420
Aver. per mo., 1918.	28,775	2,264	298	30,741
Aver. per mo., 1917.	21,486	3,703	776*	25,413
Aver. per mo., 1915.	12,021	4,605	...	...
Aver. per mo., 1913.	9,958	10,672	...	...
5-yr. av., 1910-1914.	8,280	8,399	...	...

\*Last half only.

While ferromanganese imports in 1919 were only slightly larger than those of 1918 they are still far behind the pre-war or 1913 imports. The maintenance of a moderate export trade last year is a feature of 1919 conditions in this industry.

## Supplies of Manganese Ore

Imports of manganese ore in 1919 were less than in 1913 and only slightly more than in 1915. They were far less than in 1917 and 1918. The following table gives the data as to manganese ore imports into the United States:

Manganese Ore Imports		
	Total	Aver. Per Month
To Oct. 1, 1919.....	269,411	29,935
October .....	15,863	...
November .....	11,694	...
December .....	36,376	...
Total, 1919.....	333,344	27,779
Total, 1918.....	491,303	40,942
Total, 1917.....	629,972	52,498
Total, 1915.....	320,784	26,732
Total, 1913.....	345,084	28,757

Imports of ore are now about equal to those in 1913. The receipts of manganese ore in Great Britain have experienced a striking decline. The industry there is intimately related to that in this country and for that reason the following table of British import statistics is given:

## British Imports of Manganese Ore

	Total	Aver. Per Month
1919 .....	265,800	22,150
1918 .....	365,606	30,467
1917 .....	331,264	27,605
1916 .....	439,509	36,625
1915 .....	377,324	31,443
1914 .....	479,435	39,953
1913 .....	601,177	50,098

The 1919 imports were only about 45 per cent of the record rate in 1913 and they have declined almost yearly since then.

## Supplies and Needs in 1920

Not long after the United States entered the war it was officially estimated that the monthly needs of the steel industry were 28,000 tons of ferromanganese. This was based upon the use of 80 per cent alloy and a steel output of around 43,000,000 tons. The foregoing analyses show an average available supply of 20,372 tons per month up to January, 1920. Assuming the 1920 steel output to be close to 42,000,000 tons based on the production in January, and that 74 per cent of this is open-hearth steel with two-fifths of the Bessemer output absorbing spiegeleisen as high carbon steel, the following calculation gives the estimated amount of 80 per cent ferromanganese necessary this year at 17 lb. per ton of steel produced:

42,000,000 × 74	= 31,080,000	Gross Tons open-hearth steel.
42,000,000 — 31,080,000	= 10,920,000	Bessemer steel.
10,920,000 × 2/5	= 4,368,000	high carbon Bessemer steel.
10,920,000 — 4,368,000	= 5,552,000	low carbon Bessemer steel.
31,080,000 + 5,552,000	= 36,632,000	steel requiring ferromanganese.
36,632,000 × 17 = 622,748,000 lb.	= 278,000	ferromanganese necessary in 1920

Adding to the above 278,000 tons the 10,000 tons estimated as needed in the iron foundry business, we have 288,000 tons of 80 per cent ferromanganese as necessary for the American steel industry's needs in 1920. To meet this total we have the probable available supply of 252,744 tons [(18,062 + 3000) × 12] based on the assumption that the 1920 monthly domestic output will be equal to that of January, and that the imports of British alloy will average 3000 tons per month. Allowing for the usual errors in an estimate of this kind and the use of spiegeleisen as a partial substitute, the apparent deficiency at the present rate of output is only about 36,000 tons.

The last analysis of this nature, covering the early part of 1919, appeared in THE IRON AGE, Dec. 4, 1919. Similar reviews of the manganese-iron alloy situation appeared in THE IRON AGE Dec. 6, 1917; Jan. 31, 1918; April 11, 1918; July 25, 1918; Dec. 28, 1918; Feb. 20, May 15 and Aug. 28, 1919.

## Exports of Metal Working Machinery

WASHINGTON, Feb. 17.—France is again the largest purchaser of American metal working machinery. The figures compiled by the Department of Commerce of these exports in December, 1919, show that the French importations from the United States aggregated \$963,773 out of a total of \$3,405,720. England was second with an aggregate of \$822,250 and Canada third, with \$540,418. Japan, which had been near the top of the list for many months, dropped to \$61,559—less than half the total which went to British India, \$164,193, and smaller even than the portion of Australia, \$73,963. An interesting item is the exportation of \$88,794 worth of lathes to Mexico.

A special meeting of the stockholders of the Pittsburgh Forge & Iron Co. will be held in its offices in the Chamber of Commerce Building, in that city on March 2, to vote on an increase in its capital stock from \$205,000 to \$300,000. On Dec. 16 last, the directors passed resolutions in favor of this increase, subject to its being ratified by the stockholders.



# Modern Foundry for Aluminum Castings

Conveyors for Castings as Well as Sand in Plant of Aluminum Manufacturers, Inc.—Unique Core Room Arrangement

— BY F. L. PRENTISS —

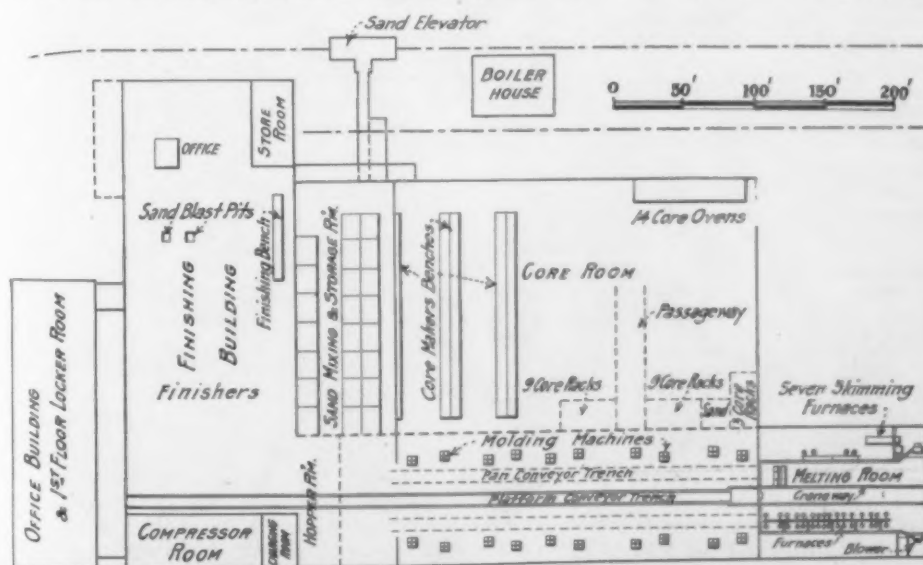


TWO notable additions have been made to the aluminum casting industry during the past few months by the construction of new aluminum foundries in Cleveland and Detroit by the Aluminum Manufacturers, Inc., formerly the Aluminum Castings Co. The erection of these large aluminum foundries was started late in the war to meet the demands of the Government for aluminum castings for Liberty motors for airplanes, but after the signing of the armistice the plants were completed according to the original plans, and both have been placed in operation recently for the manufacture of aluminum castings, mostly for the automobile field. The two plants are

similar in size, and in general design, but differ somewhat in minor details. The Detroit foundry, which is described and illustrated in this article, is devoted almost exclusively to the making of automobile castings, the company now using its former brass and aluminum foundry in Detroit only for the manufacture of brass castings.

Automotive engineers have recently turned their attention more than ever to reducing the weight of motor cars and trucks without sacrificing strength, and the Aluminum Manufacturers, Inc., has recently developed an aluminum alloy that is expected to result in a much greater use of aluminum in motor car construction for the reason that, as it is pointed out, this alloy has sufficient tensile strength and ductility without sacrificing lightness to meet the requirements of axle housings, differential housings, wheels and other unsprung parts. While castings made of several aluminum alloys are produced in the plant, the bulk of the product is in two alloys adopted by the company as standards, and bearing the trade names Lynite 112 and Lynite 145, the latter being the new alloy. The former alloy has been made for some time, and is used for crank cases, cylinder castings and other parts in a motor car above the springs. The newly developed alloy, Lynite 145, has greater tensile strength and ductility with but a slight increase in weight. The average tensile strength of Lynite 145, as determined from standard test-bars, is given at 27,500 lb. per sq. in., elongation 4.5 per cent in 2 in., specific gravity, 2.90 to 2.96. As compared with this Lynite 112 has an average tensile strength of 20,000 lb., elongation of 1 to 2 per cent, specific gravity 2.81 to 2.86. It is stated that the ductility of the new alloy has been secured without impairing the machining qualities of the metal.

One of the most interesting features of the Detroit foundry is its very complete system of conveyors and other equipment for handling and preparing both molding and core sand and for carrying castings from the foundry floor to the cleaning room. The plant is arranged both for economy in operation by the elimination of hand labor in trucking castings, and in handling sand, and for economy in floor space. With conveyors for moving incoming and outgoing sand and for the removal of castings, it was not necessary to



A Complete System of Conveyors and Other Equipment Handles and Prepares Both Molding and Core Sand and Carries Castings from the Foundry Floor to the Cleaning Room. Sand is stored in concrete bins, shown in the upper illustration, to which it is delivered by a conveyor system and is discharged at the bottom of the bins into a court

provide space for either sand or castings in laying out the molding floor, and consequently the size of this floor is unusually small as compared with that of the cleaning department. With the conveyor system molding sand is kept in constant movement from the time it is shaken from the molds until it returns to the foundry floor ready to again go into the flasks. Core sand, chills, gaggers, wires, etc., are served to the core benches by dump cars from an overhead aisle, and the core sand, after being knocked out, is handled by a conveying system, reclaimed and returned to the sand bins. All sand is kept under roof in a steam-heated building, into which it is brought by a conveyor. All handling of cores from the core room to the ovens and from the ovens to the assembly department, and from the assembly to the machines, is done with electric trucks.

The plant is laid out for straight line operation. Hot metal is carried on overhead hoists that extend through the center of the melting room and down the center of the molding room and castings on a platform conveyor that extends through the center of the molding room and on into the cleaning room. The plant has a capacity of 80,000 lb. of castings in nine hours. It was designed for continuous operation in three 8-hr. shifts, but this has now been discontinued.

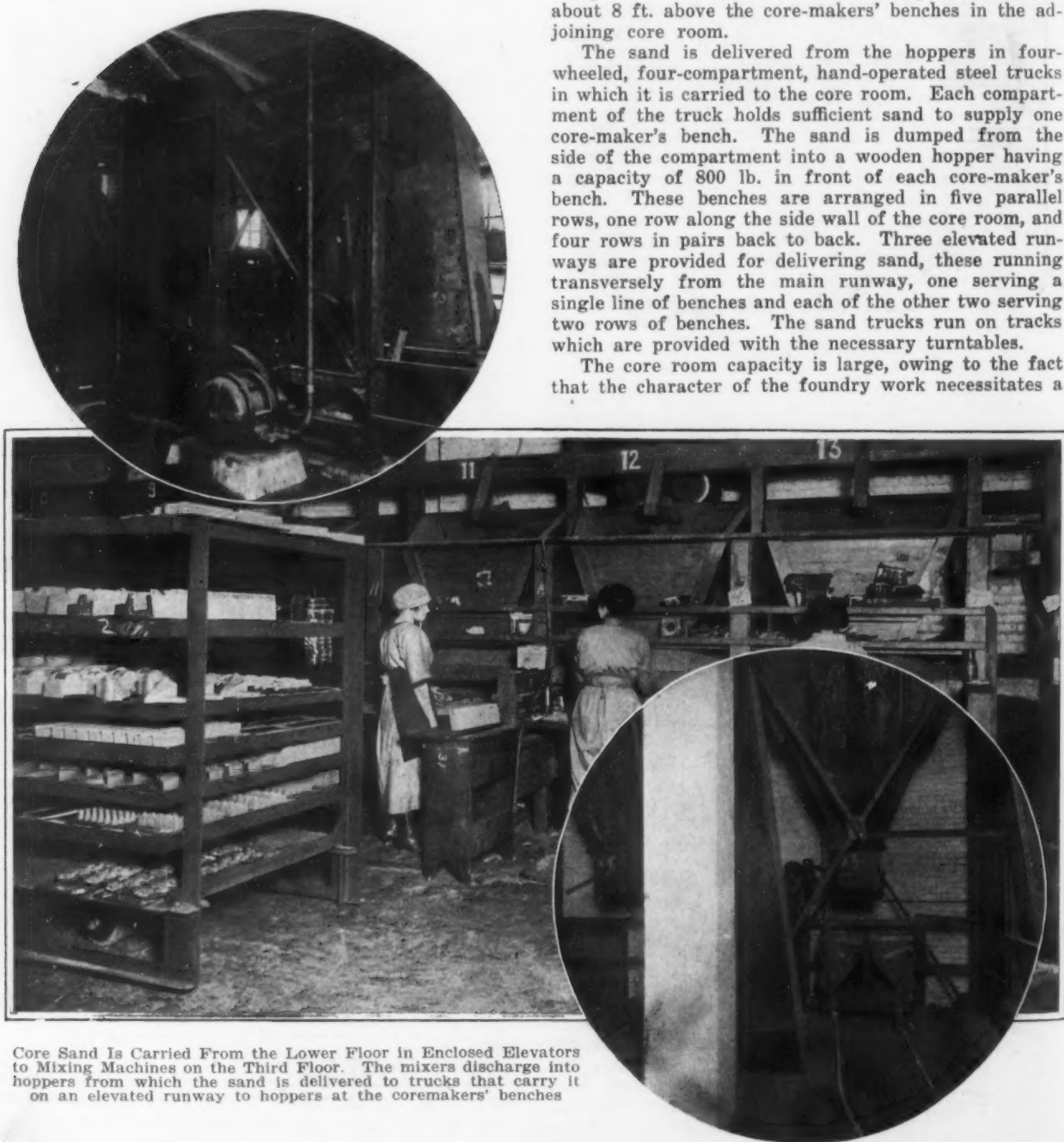
The mechanical sand handling system starts with

the unloading of cars. New molding and core sand is dumped from freight cars into a hopper beneath the track in a sand elevator building. From this hopper it is elevated 35 ft. by a bucket elevator and delivered to a belt conveyor which conveys it across a bridge about 200 ft. to the sand mixing and storage room, and discharges it into storage bins. There are 22 of these bins, built of concrete 18 ft. long, 14 ft. wide and 20 ft. deep. The bins are arranged in rows with a court between one single and two double rolls on the same grade as the foundry floor. Sand is discharged from gates at the side of the bins at the bottom, and is shoveled into pails for making up the charge for the core sand mixing machines. Five kinds of raw sand are used in making the compounds, and three different compounds are provided for making cores.

At present core sand is wheeled to hoppers located at the end of the sand storage room, from which it goes to the mixers, but a gravity conveyor will be installed on which charging boxes holding 30 gal. of sand will be run to the mixer hoppers, the total charge being 300 gal. From these hoppers elevators carry the sand to the third floor to the sand mixing and storage room, in which are located three Standard Sand & Machine Co.'s core sand mixing machines. From these machines the sand is delivered into hoppers just above the second floor of the sand room, this floor being on a level with an elevated runway that is located about 8 ft. above the core-makers' benches in the adjoining core room.

The sand is delivered from the hoppers in four-wheeled, four-compartment, hand-operated steel trucks in which it is carried to the core room. Each compartment of the truck holds sufficient sand to supply one core-maker's bench. The sand is dumped from the side of the compartment into a wooden hopper having a capacity of 800 lb. in front of each core-maker's bench. These benches are arranged in five parallel rows, one row along the side wall of the core room, and four rows in pairs back to back. Three elevated runways are provided for delivering sand, these running transversely from the main runway, one serving a single line of benches and each of the other two serving two rows of benches. The sand trucks run on tracks which are provided with the necessary turntables.

The core room capacity is large, owing to the fact that the character of the foundry work necessitates a



Core Sand Is Carried From the Lower Floor in Enclosed Elevators to Mixing Machines on the Third Floor. The mixers discharge into hoppers from which the sand is delivered to trucks that carry it on an elevated runway to hoppers at the coremakers' benches





The Core Room. Where Some of the Larger Cores Are Made on Molding Machines. In the insert are shown the core ovens and one of the trucks used for handling the core racks

large quantity of cores, and the output of this department is indicated by the fact that 125 tons of core sand is used daily. The core-making department occupies a room 260 ft. long and 120 ft. wide. The core makers' benches have adjustable tables to accommodate employees of different heights. Girls are employed as core makers in the daytime and men at night. The work is so arranged in the core room that the smallest cores are made on the first row of benches and the sizes are graded upward to the last rows on which the largest cores are made. Light cores are hand-made, but the larger ones are made on standard roll-over core machines, of the Grimes, International and Henry E. Pridmore makes.

The cores are placed on metal racks which are conveyed to and from the core ovens by Elwell-Parker elevating platform trucks. From the ovens the cores are delivered to finishing, pasting and cleaning benches, and from there directly to the foundry or to steel storage racks at one side of the core room. The company endeavors always to keep a one-day's supply in the storage racks. The core oven equipment consists of a battery of 14 oil-fired brick core ovens 16 ft. long, 6 ft. wide and 7 ft. 6 in. high, located at one corner of the core room.

The melting room adjoins the molding room and occupies a space 112 x 113 ft. This is equipped with oil-fired furnaces of the tilting type arranged in two rows on each side of the room. With the furnaces to be installed shortly there will be 44 furnaces of this type, and in addition, seven skimming furnaces for converting foundry scrap into pig aluminum. Each melting furnace has an average capacity of 250 lb. per hour, although during tests a melt of as high as 400 lb. per hr. has been attained. A thermo-couple is suspended above each furnace, and is connected to a Wilson-

Maeulen Co. indicating pyrometer located in an alcove between the melting room and molding floor. Another pyrometer is used for taking the temperature of the metal in the bull ladle before being taken to the foundry floor.

An interesting feature of the melting department is an oil-fired open-hearth furnace of a special type designed by the company's engineer for production work and still more or less in the experimental stage. This furnace has two drums approximately 7 ft. long and 5½ ft. in diameter that operate individually, each taking a maximum charge of 1200 lb. This furnace has a capacity of 4000 lb. per hr., two heats of approximately 1000 lb. each being taken from each side per hour. The cold charge is pre-heated and brought up to a melting temperature in one chamber, while the charge in the second chamber is being brought to a pouring temperature. After the latter is poured and recharged, the functions of the two chambers are reversed, the chamber that had been used for pre-heating becoming one in which the charge is brought to its final pouring heat, while the other chamber is being charged and its charge is being pre-heated. On one side of each drum is a charging door, and above the door is a pouring spout. A motor is connected to each drum for rolling it over for pouring.

The main foundry building is 285 ft. long and 113 ft. wide. Connected at the lower end is the melting room and at the other end in an extension 45 ft. wide is a sand tower, a three-story structure. In this is located the mechanical equipment for preparing and handling the molding sand.

The foundry is arranged and equipped as two complete and independent units, the only exception to the duplicate installation of sand and other handling equipment on each side of the foundry being the platform conveyor running the length of the foundry through the center on the floor level for conveying castings from the foundry to the cleaning room. This conveyor is approximately 430 ft. long. It is 4 ft. in width, being covered with sections of plate steel and moves at the rate of 40 ft. per min. The molds are shaken out over rows of grates on each side of the



foundry between the molding machines and the casting conveyor. Under each row of grates is a pan conveyor that carries the sand to the sand room and discharges it into a screen located below the floor level. This screen is 12 ft. long and 4½ ft. in diameter, and has a ¾-in. mesh.

The sand is delivered from the screen to a bucket elevator which raises it 50 ft. to the third floor of the sand tower and delivers it to a centrifugal disintegrator. From the disintegrator it is discharged into a hopper above the second floor and from the hopper it is fed into an oscillating screen to a rubber belt conveyor 24 in. wide that extends from the second floor of the sand tower the length of the foundry under the roof trusses and over the molding machines. The sand is tempered by a spray of water in the centrifugal disintegrator and by another spray after it is delivered from the oscillating feed hopper.

Sand is carried over the foundry floor on the belt conveyor, from which it is automatically scraped into hoppers suspended over the molding machines. These hoppers are of sheet steel construction, 20 x 28-in. sections, 8 ft. in length. At the bottom of each hopper in a clam-shell gate for delivering the sand to the molding machines. Sand that is not discharged from the belt conveyor to the hopper passes from the conveyor to a transverse belt at the end of the foundry and is carried back into the system over the pan conveyors under the foundry floor. A narrow platform extends along the side of each belt conveyor providing a walk for an attendant to see that the sand is being

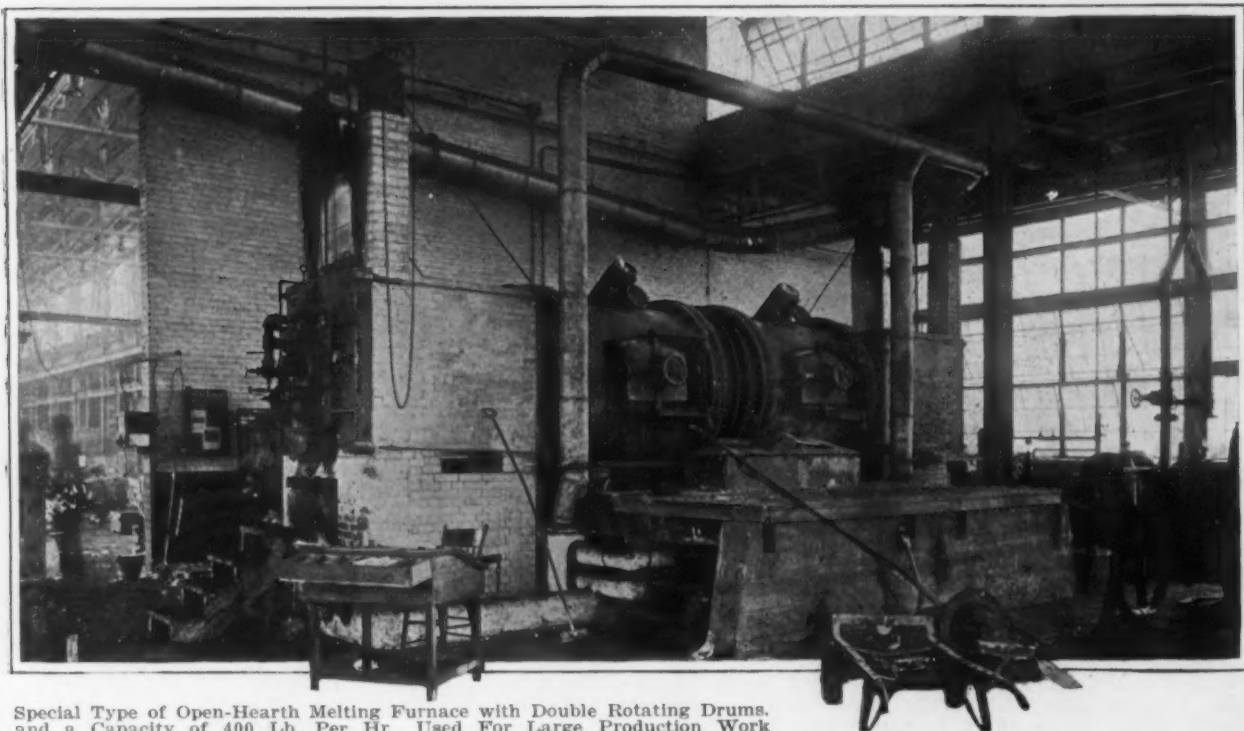
Melting Furnaces of the Tilting Type Are Arranged in Two Rows on Each Side of the Melting Room



properly distributed from the belt to the hoppers. Each system has a capacity of 90 tons of molding sand per hour. The conveying equipment, together with screens, disintegrators, elevators, etc., were supplied by the Lamson Co., Boston. The rubber belts used in the conveyor were furnished by the B. F. Goodrich Rubber Co.

Two monorails, each equipped with a 2-ton Sprague electric hoist, extend straight through the center of the foundry and melting room for conveying molten metal from the furnaces to the foundry floor. The metal is poured from the furnaces into a tilting ladle having a capacity of 1000 lb., from which it is poured into crucibles and from the crucibles into the molds. Additional tilting ladles having capacities of 1500 lb. will be added to the hot-metal handling equipment.

Each side of the foundry floor is served by hand-operated cranes equipped with 1-ton air hoists, these hoists being mostly of Ingersoll-Rand make. The cranes are used exclusively for handling the molds, one crane serving the cope and drag of one job. The cranes have a span of 33 ft. 5 in. in one bay and 32 ft. in the other bay. The inner runways of the cranes are directly above the monorail tracks used for con-



Special Type of Open-Hearth Melting Furnace with Double Rotating Drums, and a Capacity of 400 Lb. Per Hr. Used For Large Production Work



veying hot metal. There are seven cranes on one side of the foundry and four on the other. Supplementing the present crane installation three 2-ton Pawling & Harnischfeger electric cranes operated from cages will be installed in each bay for use on high production work, where greater speed is required. Then there will be a crane for every foundry floor 20 ft. wide. There will also be installed three 1-ton Brillion cranes. These will be located on a low-down transverse runway at the lower end of the foundry and will be used for light work.

The foundry is equipped with 24 rollover molding machines, mostly of the Osborn type. Green sand cores, made on the foundry floor, are used wherever possible as a matter of economy.

After the molds are shaken out the castings are placed on the platform conveyor, which extends in a straight line through the sand tower and across one end of the cleaning room. Here the castings are placed on grates at the side of the conveyor and the core sand is jarred out with pneumatic hammers. The old core sand is crushed in machines located in the basement, and is delivered by bucket elevators to

continuous glass. The double monitor type of roof provides a building of good height near the center with comparatively low side walls, and this type of construction aids in securing good lighting and ventilation. The molding and core rooms have concrete floors, the melting room a brick floor and the finishing department a wood block floor. The main building is unusually well-lighted by the use of modified street arc lamps arranged in series with powerful mirror reflectors. The lamps are suspended a few feet below the ceiling on 20-ft. centers and are 600 candlepower, 25 amperes and 30 volt.

The plant is well equipped for the convenience of the employees. There are three toilet rooms on the mezzanine floors in the main building and one in the cleaning room, and shower baths, locker rooms and a well-equipped first-aid hospital are provided.

The annual dinner of the Employers' Association of Pittsburgh was held in the William Penn Hotel in that city on Thursday evening, Feb. 5. A. L. Humphrey, president Westinghouse Air Brake Co., was



Hot Metal Is Brought to the Molding Floor with Electric Hoists on Two Monorails Running Through the Center of the Building, and Molds Are Handled with Hand-Operated Cranes Having the Inner Runway Directly Above the Monorail. Molding sand is shaken out over gratings in the floor and castings are carried to the cleaning room on the platform conveyor in the center of the floor. The sand hoppers above the molding machines that are supplied by a belt conveyor also appear in the illustration.

the second floor of the sand tower and riddled. The good sand is delivered to the sand storage bins, where a large part of it is used over again in core-making. The larger pieces of core sand that have not been broken up and the chills and other pieces of metal pass from the riddle along the conveyor, from which the chills and other metal are picked out by two girls. Pieces of metal that escape the girls when the sand is passing along the conveyor go back into the system to be sorted out when they again reach the sorting conveyor belt. The chills, made of iron, bronze and aluminum recovered from the core sand, go back to the sorting benches.

The cleaning room occupies a building 80 x 340 ft., located at right angles to the foundry, and is equipped with three sand-blast rooms, band saws, pneumatic chipping hammers and other equipment for the finishing operations.

The buildings are of steel, concrete and brick construction with continuous window surface in Fenestra steel sash. The roof of the main building is of the double monitor type, the vertical side walls of each monitor section being 10 ft. in height and fitted with

toastmaster, and introduced H. D. Wilson of the Wilson-Snyder Mfg. Co., president of the association, who reviewed its activities of the past year, and outlined its plans for the coming year. Other speakers were C. N. McArthur of Portland, Ore., who spoke on "Anti-Strike Legislation and the Public Welfare," Judge William H. Speer, "The Open Shop and American Institutions," Walter Gordon Merritt, "Industrial Legislation," and Captain P. J. Moran, "The Political and Economic Situation."

The Pittsburgh office of the International Adding Machine Co., Robert Hay, manager, has received an order for 500 adding machines for concerns in Italy and Austria. The order, amounting to about \$75,000, was taken in strong competition from Germans.

Morrison & Risman, jobbers in iron, steel and railway track equipment, with warehouses at Buffalo, announce the change in the firm name to the Morrison & Risman Co. S. Morrison and S. Risman will continue as heretofore in the active management of the business, with no change in the membership of the firm.

## New Line of Automatic Stop Alligator Shears

Doelger & Kirsten, Milwaukee, Wis., have developed alligator shears which will cut material on a bevel. The machine is equipped with special dies to suit the needs of the user. Dies of the desired angle are fitted to the lower and upper jaws of the shears which, when operated, cut the material to a corresponding degree of bevel. Round iron, for example, has been cut to a 30-deg. bevel for chain works, thereby eliminating the sawing of stock to angle, hitherto necessary in the manufacture of heavy chain. Material to be cut on a bevel is placed in the lower die, which is of the same

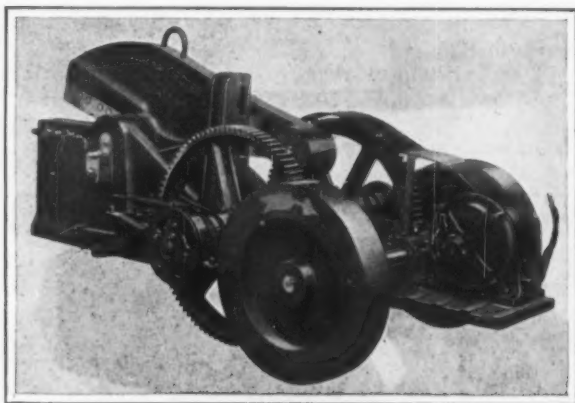


Fig. 1.—Alligator Shears with Die Equipment for Cutting Material on a Bevel. The upper jaw of the machine is fitted with a die corresponding in shape to the upper half-circumference of the bar to be cut, while a die to fit the lower half of the bar is attached to the lower jaw. A clamp on the under jaw of the machine prevents any upkick of the bar during cutting.

shape as the lower half-circumference of the stock. The upper jaw of the shears is fitted with a die corresponding in shape to the upper half-circumference of the bar so that the pressure in cutting is evenly distributed, thus making for accuracy in results. The bar to be cut not only rests in a suitably shaped die but extends under a clamp attached to the lower jaw, which prevents any upkick following the impact of the upper die with the material.

The Milwaukee firm also furnishes dies for cutting material at right angles. These dies have been used in cutting cold rolled rounds, squares, hexagons, flats and other types of bars with a marked degree of precision. As many as 24 sets of dies can be furnished for a single size of shears, three sets of upper and lower dies being applicable to the jaws at one time. A shears, for example, may be equipped to cut bars, graduated in sixteenths of an inch from 1 in. in diameter to 2½ in. The type of machine designed for this class of work is shown in Fig. 2. The three sockets for the lower dies may be seen in the casting forming the lower jaw of the shears. These dies differ from those used in bevel cutting in that they fit the entire circumference of the bar, holding it firmly while the force of the upper die severs it. The use of this type of die, it will be noted, makes the provision of clamp unnecessary to prevent the distortion of the material during cutting.

All of the machines manufactured by the Milwaukee company, whether of the simple knife type or with die equipment, are provided with automatic stops. Following the actuation of a foot lever the shears makes one operation and stops with the jaws wide open. The movement of the lever releases two jaw clutches, seated on springs, which interlock with gears on opposite sides of the crankshaft. The clutches are fitted with cams which engage rollers attached to the arms of the lever. Through this arrangement the clutches are released from the gears at the conclusion of each revolution. The shears could be stopped, no doubt, by the use of a single clutch, but the designers are of the opinion that drive from both sides of the crankshaft makes for greater smoothness in transmission, thus reducing the wear on the bearings and gears.

The Milwaukee firm believes that it is not only the first manufacturer to use double gears and double flywheels, but the first to use a babbitted frame for the moving jaw. The advantage of having the steel jaw rest in a babbitted frame rather than on a steel frame is self-evident. When signs of wear are discovered the frame can be rebabbitted in a few hours without removing the shears from its location in yard or plant.

The machines are made throughout of annealed steel castings and are manufactured in sizes suitable for cutting material from 1 in. to 5½ in. in diameter. The shears can be used for cutting boiler plate as well as bars. The same sizes of machines are made in both portable and stationary types. Portable machines have been found advantageous by contractors for cutting reinforcing bars for concrete construction. They are also used in scrap yards.

The construction of the Doelger & Kirsten shears is such that feeding can be done either from the side or the front.

## Engineers Discuss Alloyed Aluminum

Alloyed aluminum as an engineering material was discussed at the joint meeting of the metropolitan section, American Society of Mechanical Engineers, the New York section, American Institute of Mining and Metallurgical Engineers, and the metropolitan section, Society of Automotive Engineers, in the Engineering Societies Building, New York, Feb. 10. The chief speaker was G. M. Rollason, assistant director of research Aluminum Manufacturers, Inc., Cleveland, whose talk was illustrated by charts, graphs, tables and photographs thrown upon the screen. Another talk was given by Charles Pack, chief chemist Doehler Die Casting Co., Brooklyn, who passed through the audience about 50 samples of aluminum die castings.

Mr. Rollason said that we had passed from the stone age to the present iron age, and that the future might be known as the aluminum age. By graphs he illustrated the various effects as to tensile strength and ductility which different proportions of zinc, copper and other metals conveyed when alloyed with aluminum. He said that iron up to 2 per cent helped the resulting alloy. His talk and illustrations pertained chiefly to the use of aluminum alloys in the automotive industries and several of the slides showed parts before and after fatigue tests.

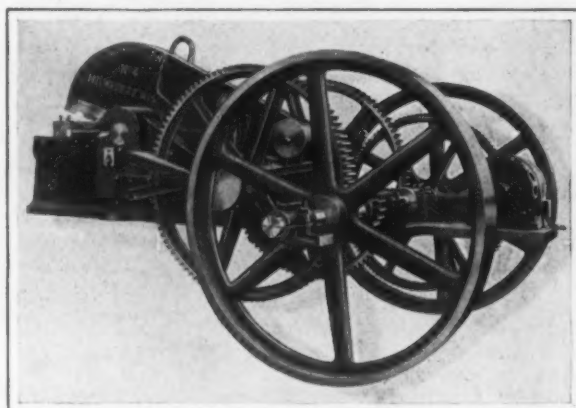


Fig. 2.—A Shears with Die Equipment for Cutting Material at Right Angles. The lower die fits the entire circumference of the bar to prevent distortion of the cross-section during cutting.

Mr. Pack told of the difficulties of die casting aluminum and contradicted the fallacy that casting under pressure tended to make the casting more solid, claiming that a skin was formed which prevented the occluded gases from escaping. Lawrence Addicks presided and in an introductory speech outlined the progress made in the use of aluminum alloys.

Among those who spoke informally were C. S. Trewin, New Jersey Zinc Co.; Dr. E. Blough, technical director, and S. K. Colby, assistant general sales manager, Aluminum Co. of America, and E. Favary, instructor in motor vehicle design at Cooper Union, New York.



# Progress in Industrial Personnel

## Some Contributions of the War Period—Job Analysis— Man Analysis—Bibliography

—BY EUGENE J. BENGE\*

THAT the period of the war brought forth many striking civil and military contributions to industrial personnel is an acknowledged fact. It is the purpose of this article to indicate briefly the nature and sources of much material that has been made available in published form.

### Civil Contributions

During the war period the industrial relations' division of the Emergency Fleet Corporation issued numerous noteworthy bulletins, a few of which are listed in the appended bibliography. The Department of Labor has also reflected brilliantly the changing demands of industrial personnel. Such publications as articles on

CAYSO	67-gb	CHEMICAL GLASS BLOWER
<b>DUTIES</b>		
1. The blowing or fabrication of flasks, bottles, instruments and intricate chemical apparatus.		
<b>QUALIFICATIONS</b>		
2. At least one year in a glass factory blowing flasks or bottles from the fused mass; ability to fashion tubing or preformed material into intricate forms for chemical work, such as condensers, pycnometers, potash tubes, retorts, distilling bulbs and flasks, etc.		
<b>SUBSTITUTE OCCUPATIONS</b>		
3. Glass Blower, Electric Bulbs. Glass Blower, General.		

Fig. 1—Descriptive Specifications for Eligibility as a Glass Blower in the U. S. Army. In all 565 such job analyses were adopted

the Cost of Living, bulletins on Descriptions of Occupations, Training Service Bulletins and the like should be in the hands of all who direct industrial relations' activities.

A few highly significant books have appeared. Kelly's "Hiring the Worker" presents a good cross-section of the employment field; Bloomfield's "Handbook of Employment Management" contains fully fifty of the most important articles in the field; Link's "Employment Psychology" sets forth results accomplished by the introduction of scientific methods and psychological tests into the employment process of a munition factory; Allen's "Instructor, Man and the Job," gives detailed procedure for the organization of the training department.

The various miscellaneous publications listed in the bibliography indicate the diversity of the sources which are contributing to the personnel field. To these must be added the hundreds of magazine articles, key to which may be found in the "Readers' Guide," in any library.

### Military Contributions

As the military problem unfolded, six cardinal principles were crystallized:

1. Functionalization—the control and administration of personnel as "the first duty of an official who should give it his undivided thought and best energies."
2. Human differences—the realization that a great number of human traits, in varying quantity, go to make up any individual.
3. Definite personnel requirements—the specification of the kind and amount of ability necessary to man each unit.
4. Organization—clock-like precision in the working of the personnel division itself.
5. Economy of man power—the placing of a man where his particular abilities were most needed.
6. Morale—a consideration of the human element in making placements and transfers.

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The procedure followed in carrying out the aims of the personnel division may be subdivided as follows:

### Job Analysis

1. Classification of occupations, and standardization of terminology.
2. Preparation of job specifications.
3. Compilation of tables of occupational needs for each unit.

### Man Analysis

1. The interview.
2. Tests: mental, trade, physical.
3. Follow-up.

### Job Analysis

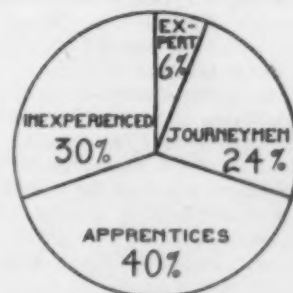
In the first step under job analysis, each general heading of an occupation was assigned a number and specialized phases differentiated by letters. Thus the symbol 37co indicated a cost accountant. Descriptive specifications for every army "job" were next developed. In Fig. 1 may be noted how effectively the job has been covered. Most of the 565 Army specifications are readily adapted to industrial needs.

Inasmuch as it seems certain that a valuable pamphlet entitled "Instructions Governing the Preparation and Revision of Personnel Specifications" will not be made available for distribution, one section of it is very briefly summarized below:

### Rules in Formulating Definition of Duties

1. Do not capitalize titles or unit designations.
2. The entire definition should be stated in a single paragraph, consisting of one or more sentences.
3. Use the singular number, regardless of the number of men contemplated to work on a job.
4. Use an active verb in describing duties.
5. Omit subject of sentence when it is identical with the title of job being described.
6. Omit all articles unnecessary to sense.

Fig. 2—Chart of Trade Test Ratings. In all 112 trade tests were developed. The rating scale principle is principally applicable in industry in comparing the qualifications of minor executives



7. Omit all qualifying adjectives or phrases, unless they are important to the sense as limiting duties.
8. If qualifying phrase or adjective makes meaning more clear, although unrelated in part, retain it.
9. Do not use technical terms without explanation.
10. Arrange contents of description logically.
11. Where duties vary, place emphasis on proper phase.
12. State duties as duties and not as qualifications.
13. State nothing but duties in this section of specification.
14. State what the duty is, not how it is done.
15. Do not describe routine duties in detail.
16. Avoid generalities.
17. The reading of duties alone should, without reference to any other data, make apparent what job is meant.

Finally, for each unit of organization, there was developed a table of occupational needs, which indicated

the number and kind of occupational specialists required. This principle would seem to be applicable to industrial organizations as well as to the military.

The various manuals issued by the Committee on Education and Special Training, and the two monograph series of the Federal Board for Vocational Education constitute important contributions for job analysis as well as for industrial training work.

#### Man Analysis

The interview, as the first step in man analysis, connoted trained interviewers, and a standardized "ap-

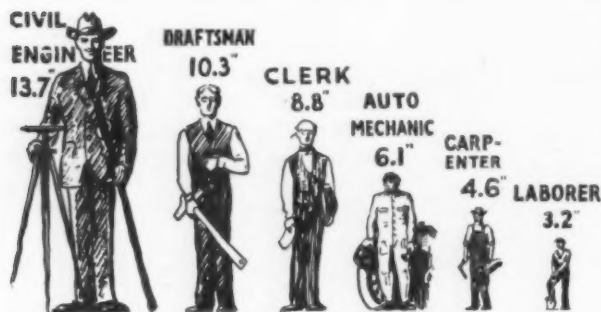


Fig. 3—Pictogram of Average Mental "Heights" of Several Classes of Workers in the U. S. Army

plication blank" called the qualification card. It was realized that this card should—

1. Be as simple as possible.
2. Be adequate for the needs of the service.
3. Provide for simple cross-indexing.
4. Provide for distinguishing between degrees of skill.
5. Fit a standard filing system.

The "signal tab" system was used for cross-indexing, different colored tabs indicating different degrees of skill.

The accompanying pictogram (Fig. 3) indicates one of the important contributions from the mental tests given in the Army: The discovery of the average intelligence for hundreds of occupations. This chart of mental "heights" does not mean that every civil engineer is more intelligent than every draughtsman, but rather that the average civil engineer is more intelligent than the average draughtsman. The knowledge that an applicant rates mentally above the average of his group is a valuable index to the employment manager.

In the use of mental tests in the selective process there are many pitfalls. If tests are not administered by someone who is capable of accurately interpreting results, then mental tests were better omitted from the employment department.

In order to secure accurate appraisal of the trade skill of an applicant trade tests were developed. The following three points were considered the necessary characteristics of a good trade test:

1. It must differentiate between the various degrees of trade skill.
2. It must produce uniform results in various places and in the hands of different, though trained, examiners, who need not themselves be skilled in the trades tested.
3. It must consume in the giving the minimum amount of time, energy and material necessary to produce the above results.

Three types of trade test were finally devised. These were:

1. The oral trade test, in which the man was asked certain specific questions, and points assigned on the basis of his replies.
2. The picture trade test, which consists of identification of pictures showing kinds and parts of machines, etc.
3. The performance trade test, which consists of the actual performance of the work according to definite instructions, blueprints, etc.

The accompanying chart (Fig. 2) shows the various percentages in the Army attaining each rating in the trade tests. If men above the draft age had been

included in these percentages, the expert and journey-men groups would undoubtedly have been larger.

Altogether 112 trade tests were developed, covering various subdivisions of the following trades: Auto repairer; baker and cook; blacksmith; boilermaker; bricklayer; butcher; canvas worker; carpenter; chauffeur; chemist; clerical worker; electrician; engineman and fireman; foundryman; horseman; instrument maker and repairer; leather worker; lineman and cableman; machinist and mechanic; painter; photographer; pipefitter; printer; rubber worker; sheet-metal worker; stenographer; typist; structural steel worker; surveyor; tailor; telegraph and wireless operator; telephone man; welder.

The rating scale was used in the Army as a systematic follow-up of officers and, finally, promotions came to be based upon it. Although the rating scale principle is applicable to industry, particularly for the comparative rating of minor executives, it would be highly inadvisable for any personnel manager either to adopt the Army scale bodily, or to devise one of his own before he had read what little literature there is existent on the subject. The reader who may be interested is referred to the personnel manuals, and to Bloomfield's "Handbook of Employment Management."

In closing, it would seem perhaps to be a truism to state that the personnel manager who is familiar with the great contributions made to his field during the war period is professionally far in advance of his less informed fellow worker.

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## The Solvay Thrift Plan for Industrial Employees

Voluntary Savings of Employees Deposited to Individual  
Accounts by Weekly Check from Employing Company

—BY H. W. JORDAN\*—

THE Solvay Bank, Solvay, N. Y., a suburb of Syracuse, is conducting a community thrift plan which accumulates the systematic deposits of industrial employees by collecting them in a lump sum each payday from the employer, under an arrangement which makes each individual's account with the bank his own private enterprise. Each depositor is encouraged to make his deposits for home ownership, or some similar long pull purpose.

The employer assumes no responsibility except that of depositing the money, and he makes the deposit only on the written request of the employee.

The system involves no services of any out-of-town thrift collecting agency, nor is it a form of Government savings, the success of which may depend eventually upon the efficiency of Government, or volunteer collectors; and it does not accumulate any Government fund, which in later years might become subject to misuse and political criticism. It is purely a personal affair between each depositor and his local bank, with the employer making the deposits on each payday, as a matter of convenience to the employee.

Four per cent interest is paid on deposits, beginning the first of the calendar month following deposit. Interest is compounded semi-annually.

### How the Plan Functions

Having arranged to conduct the Solvay thrift plan, the bank presents its educational advertising to the employees. This is done by a representative of the bank or by the company, or jointly. The plan can be conducted wholly by the employer, if preferred; and if the company is sincere and energetic in its desire to promote thrift, this is the better way.

Any employee who wishes to become a member of the Solvay Thrift Club fills out a written request that his employer deduct \$1, \$2, \$5 or any desired sum from his pay, and deposit it each payday in the bank. The request form has a blank line, headed "My Purpose in Starting this Account is \_\_\_\_\_," and each depositor is encouraged to give a long-term motive, such as home ownership or life insurance. He is not limited to one bank, but he can have his deposit made at any bank, which has arranged with the company to conduct this system. Employees thus become members of the Solvay Thrift Club.

The company completes its share by depositing the total of the individual sums which have been requested.

Each pay envelope is stamped across its face "Total \$— Deposit for Solvay Thrift Club \$—. Balance \$—."

The depositor is saved the time and carfare which he would expend, if he made the deposit himself. This is often more than the first year's interest on the deposit.

All motives are directed toward the ultimate purpose of providing a reserve on retirement from active em-

ployment, and an estate at death. The underlying principle of the Solvay Plan is to make thrift a lifelong habit. An important feature is that the individual initiative and business ability of the employee is persistently encouraged, as the employer assumes no financial responsibility, except that of depositing the money.

The plan is completely flexible. Any person can become a depositor as an individual, but the method is particularly designed to promote industrial employee thrift. The sums are those which each person decides he can afford. If for any good reason, one is unable to make his deposits, he requests his employer to omit it on one or more paydays. The omission is noted by a slip which passes to the bank, until the deposits are begun again.

If the depositor wishes to withdraw his money, he goes to the bank and makes the withdrawal, which is noted on his record card or book, together with the balance remaining on deposit. The bank does not object, if the reason be a good one, but the teller or cashier tries to convince him that it is to his advantage to continue the deposits and attain the object he selected.

The thrift deposits are not subject to check, as that would defeat the long continuing purposes of the plan.

### Education of Worker's Family in Thrift

The plan is especially adapted to thrift accumulations by women, and particular encouragement is given to their accounts. It also lends itself to children's thrift, as it helps the child to form the habit of systematic preparation for future needs, such as the purchase of clothes, payment for college education, and the like.

The Solvay thrift plan enables any bank with small banking quarters to handle large numbers of individual accounts, without crowding the bank nor interfering with the business of larger depositors. The weekly or monthly payday deposits are made by a single check. Withdrawals are at infrequent times, and scattered through the year, so that the thrift people coming to the bank are easily handled with ordinary floor space and banking equipment.

This plan is the result of a study to secure a system of employee thrift which gives the utmost benefit to the employee and uses the resources of his employing company to protect his interests, while avoiding the entanglements which have characterized employee thrift in the past. The company gives the benefit of its organization, without undertaking any responsibility for investing the money. Each account is wholly the employee's own affair.

The company plays an active part in helping educate its people in home ownership, life insurance and the accumulation of an estate. It exerts a wholesome censorship over the funds by taking care that the bank acts as a capable trustee. And the system identifies those employees who are most capable and prudent in their own affairs, and hence most desirable workmen.

\*Manager, department of special products, Solvay Process Co., Syracuse, N. Y.

## MAKING A FACTORY NEWSPAPER

Organizing the Staff—Getting the News—Features that Make for Success

BY CARL R. MILLER

The factory periodical has rapidly advanced to a position of importance as an instrument of welfare work in nearly all of the larger industrial plants. The advertising department's exchange table is full of the "Mixers," "News," "Tapes," and many other varied-named publications, each bearing its compilation of department gossip and activities. The usual type of factory paper, quite popular at present, is the kind printed in time to accompany the Saturday pay envelope. It is the product of the advertising department plus the hearty co-operation of every workman of the plant. The paper should interest each employee from the newest laborer to the chief executive. A few workable methods which will enable the news staff to accomplish this end may be considered.

The organization of the news staff of a periodical is obviously an important factor in house organ publishing. Naturally upon the kind of news staff recruited from the plant employees will depend to a large extent the paper's success. The journalistic ideal to interest all of the people all of the time must be kept in mind; and one way of putting this principle into effect is to have every workman a contributor of information. Reporters are selected as representatives from each department, division, or activity of the factory. The names of the news gatherers should be displayed prominently in the paper as encouragement and recognition of their work. The reporter, of course, should be a good "mixer," know every one in his particular department, and should possess a so-called nose for news, that is, he should be on the watch for interesting gossip or stories concerning employees that may be converted into good copy.

The employee should be encouraged to hand in contributions. If he is unable to write the story himself a reporter may be sent who will put the item into readable form. The story of a fishing trip, an outing party, a funny incident in the routine of the day's work may contain enough of the human interest element to make the type of yarn suitable for the columns of the paper. The average workman will be glad to furnish his share of news once he understands the sort of material needed. These news sources are invaluable to the editor who desires to make his paper reflect the life and spirit of the employees. An effective method of getting contributions was practised by the periodical of a well-known company recently. The cartoonist of the staff drew a sketch, portraying some object of universal interest and appeal. The cartoon was run in an issue of the paper and the readers were invited to write their own editorial interpretation of the drawing. The editor stated that the best articles on the subject would be printed in the next number. Needless to state, the contributions proved an attractive feature.

Second only in importance to the news columns is the use of illustrations. In this field the factory paper, which is usually printed on good book stock, has rare possibilities for displaying originality and attractiveness in make-up. As it often happens, the halftones to be used in the periodical are made in the factory's own photo-engraving plant, and thus the cost of production is reduced. The popularity of the illustrated factory publication may be noted by a glance at the type of paper which is the product of some of the better known industries. There is scarcely a page that does not contain several halftones from snapshots of employees or their families, views in or about the plant, or photographs of some popular plant activity. Should the organization have a camera club the source of plenty of good photographs is evident. Every amateur kodaker will be glad to see his best work published, and his views, especially if the subjects are of local interest, will be the best of human interest material. Baby pictures, employees' homes or gardens, or some of their pet hobbies—the favorite dog, cat, or the prize rooster—all come in for their share in making a periodical readable by all the workers.



Suggestions for Department Captions for the Factory Newspaper

The illustration has a definitely unique effect in its appeal to the eye. It may sometimes happen that the heavy printed page without the attractiveness of a picture is passed by with only a glance of the reader. However, the photograph will always be noted. In instances where many of the readers of the publication are foreigners illustrations are practically the only features observed.

Recruited from the ranks of the numerous co-workers is the aspiring McCutcheon or Briggs who is anxious to try his hand at cartooning. Given 70 per cent idea and 30 per cent technique, the amateur cartoonist can produce a panel or strip decidedly worthy of reproduction. Often a comic incident well written may be cleverly illustrated. The portrayal of the plant picnic, a social event, or the graphic interpretation of current events are suitable subjects awaiting the pen of the caricaturist.

How may interest in the small periodical be maintained? The query is an oft-recurring one to those who are responsible for the paper. In regard to popularizing a publication a lesson or two gleaned from the current magazines may be profitable. One method applicable to the plant newspaper is the use of special numbers. For instance, these special editions may be announced in advance and the readers made to anticipate them by mention of the general contents. This is especially a desirable method where the publication is issued monthly in the form of a magazine. To illustrate: The special numbers may be run as "garden," "spring," "north pole," "little tots," "home," as well as the usual holiday editions. A surprising amount of interest is usually created by the use of this method.

The small industrial publication can be made to fill a want in the industrial community. In the hands of an enterprising management it creates a friendly attitude among workmen and officials; it is a sort of public forum where problems that confront the company and its community of fellow-workers are threshed out. It assists in uniting the different groups of co-workers into one big family.

Bids are to be opened shortly by the Columbia Graphophone Co., Bridgeport, Conn., for the construction of the company's plant at Baltimore. The building will be 260 x 380 ft., six stories and cost in the neighborhood of \$2,000,000. This will be the first unit and it is understood will be but one of about 10 similar structures.



# The Open-Hearth Furnace and Processes\*

## Problems That Are Uppermost—Method of Lessening Inclusions—Rôle of Iron Ore and Manganese—Merits of Different Casting Temperatures

BY DR. HENRY M. HOWE

A FEW years ago you had a general paper on the blast furnace, which was followed by many papers each dealing with some specific phase of blast furnace practice or construction. These collectively form the most comprehensive and probably the most valuable treatise ever written on this subject.

You propose a like treatment of the open-hearth furnace and processes. With the aid of William R. Walker and John H. Gray of the United States Steel Corporation I have made an outline sketch of this subject. This, I understand, is to be followed by a series of papers of which Mr. Fry's contribution of to-day ["The Manufacture of Ingots for Locomotive Tires and Wheels"] is the first, each treating some important feature of open-hearth construction or procedure.

Briefly, several features of this general subject which seem fitted for careful treatment in this series are as follows:

First, taking up furnace construction, we may ask our mechanical engineers whether they cannot design the tilting furnace so as to reduce the cost of its upkeep till it no longer is a serious consideration in deciding between the tilting and the stationary furnace. And we should discuss the real saving in time and the other advantages of tilting and the conditions under which it is most useful.

The efficiency of the open-hearth furnace depends in large part on that of the regenerators regarded as heat filters. Our present ones seem very crude, having, for instance, about the same construction in their upper as in their lower parts, though the heat conditions differ so enormously from top to bottom. We may well ask whether the passages should not be larger above, where the gases are so greatly expanded, than below. Further, whether the bricks themselves may not be improved. They catch and emit the heat at their surfaces only, but store it in their interiors. Hence their surfaces should be extensive and their material should transmit heat readily from surface to interior and back. This transfer calls for a dense, and perhaps even a semi-glazed state. A hard brick of great conductivity, even if too fusible for the upper part of the checkers, might well be used in the lower part. Again, the extent of surface might be increased, first, by making the bricks very thin, and second, by ribbing their sides with vertical ribs that would not catch the dust.

### Shape of Ports and Valves

The efficiency of the furnace depends further on the accurate retention of the shape of certain parts, for instance, the ports and valves. It may be well to inquire carefully in what parts of the furnace the advantage of accurate retention of shape by means of water cooling outweighs the loss of heat involved. For moving the incoming and escaping gases, how does the profit from using fans compare with the cost of their installation and operation? Their use thus far is promising. I introduced them for both purposes in 1874.

We may ask what the useful limit of size of the furnace itself is, the limit where the disadvantages of irregularity of temperature and composition and of excessively great units for soaking and rollings outweigh the advantage of saving of fuel, labor and installation per unit of product. This limiting size will be greater for quantity than for quality practice.

How should the pitch of the ports be related to the length of the furnace, to the kind of fuel and to the stack? Flatter ports might be needed for charges rich in scrap, which have to be protected from oxidation

during melting, than for molten pig iron, which has to be oxidized vigorously.

How deep should the bath be at its deepest point, first, so that it may work as fast as is consistent with thorough control; second, that we may gain the economy of large charges.

Turning now to the open-hearth process itself, we find many matters pressing for attention. Perhaps our greatest need is to impress on our operators the extreme importance of controlling the composition of the slag, and especially of lowering its iron oxide. Precise maxima of iron oxide permissible for various processes and grades of steel should be established and should be incorporated in all important contracts, quite as rigorously as the permissible sulphur and phosphorus contents of the steel itself.

### Lessening Inclusions

The methods of lessening the quantity and harmfulness of inclusions need great improvement. Two essentials seem to be important: First, ample time for the inclusions to rise by gravity in furnace, ladle and perhaps mold; and second, fusibility of the oxides formed by the final deoxidizing additions, so that they may readily coalesce into particles large enough to rise rapidly. As a step toward this last we should determine systematically the melting points of the combinations of oxides which it is practicable to form with these additions.

The quiet which results from thorough deoxidation of metal and slag may be held to have two simultaneous but opposite effects. It facilitates the rising of inclusions of given size, but it does not favor the coalescence of particles into masses large enough to rise fast, as rapid movement does. Witness churning for butter.

### The Use of Iron Ore and Manganese

How far is the objection to the use of ore justified? We object reasonably to the use of rusty scrap because of the irregularity in the quantity of oxygen which this causes. In treating charges containing any considerable quantity of pig, much oxidation has to be done. Some very competent men would have this done wholly by the furnace gases and object to the use of ore, apparently on the ground that the resulting local over-oxidation is not readily overcome. They would have the oxidation superficial, brought about by the slag rather than by iron ore submerged in the bath itself. The evidence should be examined with care. We should not be led away by unsupported theories, however plausible. Certainly the excellence of the acid open-hearth steel made with moderate use of ore sets up something of a *prima facie* case for oreing.

Should residual manganese be insisted on in making fine steel, and in general that on which human life depends? The demand for it rests on the belief that oxidation by means of manganese, acting as a carrier of oxygen, is beneficial in that it does not lead even to the temporary formation of iron oxide within the metal. This should be tested more thoroughly. If true, then the benefit of this treatment should cause some special merit in the product in the way of a specially high combination, for instance, of elastic limit and ductility or shock resistance, and the specifications might be amended so as to reject steels which lack it. I refer, of course, to steels for important purposes, failure in which would endanger life.

The relative merits of the basic and acid open-hearth processes should be established more firmly. The comparison should be made between the two as practiced under truly comparable conditions, for instance, with

\*A paper presented at the fall meeting in October of the American Iron and Steel Institute in New York.

nearly equal strength of deoxidizing conditions and not between basic with 80 per cent of pig iron and acid with only 25 per cent.

The advantages of the dominant pool of the Talbot process should be evaluated, so that they may be weighed against the disadvantage of having to make the steel in the ladle. Do we really gain enough time by leaving part of the charge in the furnace to overcome the objection to ladle steel-making with its irregularity of composition.

#### Merits of Casting Temperatures

We should satisfy ourselves that our American practice of using a low casting temperature for fine steel instead of the high temperature used in Continental Europe is right and ask searchingly whether its advantages of giving freedom from surface cracks and of restraining both axial segregation and the coarseness of the columnar crystallization really outweigh its disadvantage of giving less opportunity for the inclusions to escape in the ladle.

The relative advantages of limestone and lime should be weighed. Limestone is a cheaper material than ore for bringing on a boil, and with it we avoid introducing iron oxide into the molten metal as ore does, thus substituting superficial or slag oxidation for internal or submerged oxidation by the immersed ore. On the other hand, it is derided as using the costly heat of the open-hearth to do the work of the cheap heat of the limekiln. How does the extra cost of this heat compare with the alleged advantages?

#### Duplexing and Triplexing

Turning now to the compound processes, including the duplex, triplex, Bertrand-Thiel and others, we may divide each into a roughing and a finishing phase. The chief reason for their existence is to separate the silica formed by the oxidation of the silicon of the pig iron from at least the last part of the dephosphorization and desulphurization. Hence they seem applicable primarily when an abundant pig iron needing dephosphorization or desulphurization is to be treated.

Among their additional advantages are, first, their power of concentrating the phosphoric acid in a relatively small quantity of slag, which may be useful as a fertilizer even when the stock contains relatively little phosphorus; second, their use for making alloy steels directly and relatively cheaply from molten open-hearth or conceivably Bessemer metal; and, third, their improving the quality of molten blown Bessemer metal by treating it directly and cheaply in the open-hearth or electric furnace, thus getting part of the cheapness and rapidity of the Bessemer process together with a quality at least approaching that of open-hearth steel.

These advantages are to be weighed against the inevitable serious loss of heat in transferring from one furnace to another and the total loss of the initial manganese in the roughing phase, compelling us to replace it in the finishing phase if we are to have the benefit of residual manganese. For the roughing phase the Bessemer converter, both acid and basic, the basic open-hearth and the basic lined mixer are applicable; for the finishing phase, the basic open-hearth and the basic electric furnace.

#### Units in the Roughing Phase

Here we should study the relative advantages of the three roughing furnaces. In using the Bessemer process for roughing we usually blow about two-thirds of the pig iron very full and the remaining third, or "kicker," only halfway, to the end that the carbon left in the kicker, about 1.75 per cent, may react vigorously on the iron oxide stored up in the full-blown metal and bring on a boil. This full blowing wastes iron, time and steam, so that the resulting oxide is extremely expensive. We should satisfy ourselves whether its convenience justifies its use in place of iron ore or scale. Beyond this costliness we may ask whether here, as in Bessemer practice in general, we do not sacrifice quality unduly to the convenience of having a clear signal for ending the blow, remembering how the Swedish Bessemer steel caught on the way down compares in reputation with our full-blown product.

We should ask further how far the damage to quality due to Bessemerizing is remedied in the finishing process and how this finishing must be done to make this remedy effective. If this damage represents simply imperfect deoxidation of the iron and imperfect removal of inclusions, the general direction of the remedy seems clear. Of the two other roughing furnaces, the basic open-hearth seems to commend itself best when the pig iron contains relatively little silicon, and the mixer when it contains much, because of the greater trouble which silica gives in the open-hearth than in the mixer. We should seek clearer definition of the conditions appropriate to each of these two furnaces and should ask what advantages the open-hearth has over the mixer to compensate for its higher operating cost, due to its smaller scale of working and its more intricate construction.

Again we should ask how far it may be possible to reduce the disadvantage of the Bessemer, its loss of iron, while retaining its advantage of rapidity and cheapness, and thus to invade with it the field now occupied by the basic open-hearth and mixer as roughing tools.

#### Refractories Advance Ten Per Cent

The prices of refractories, which had been reduced about 10 per cent April 1, 1919, to conform to the new steel prices of March 21, have in most cases been restored to their previous higher figure, due to a very active demand. The leading makers in the Pittsburgh district are sold ahead for two months or more. Prices for export are about the same as for domestic consumption except in cases where brokers add two or three dollars to cover their commissions.

Reports from Pittsburgh state that first quality central Pennsylvania and Maryland fire brick for blast furnace and steel mill use is selling at from \$40 to \$45 per 1000, Pittsburgh; Ohio and Kentucky brick, about the same; St. Louis, \$40 to \$50; silica, \$45 to \$50.

The following prices are being charged by Cleveland dealers, f.o.b. factory: Magnesite brick, \$80 per ton; silica brick, \$45 per 1000, the advance from \$41 having gone into effect Feb. 2; fire clay brick, high grade, \$45 per 1000; magnesite, not in brick form, \$30 to \$35 per ton.

According to the Chicago office of a refractories company, fire clay brick of first and second qualities advanced \$5 per 1000 two weeks ago, while there were no changes in silica, chrome, magnesite or bauxite brick. Fire clay and silica brick advanced early in January, having been stationary in price for about nine months. This company is maintaining the following price schedule, all f.o.b. works:

Fire Clay Brick, First Quality, Per 1000	
Pennsylvania .....	\$41.00 to \$50.00
Ohio .....	41.00 to 48.00
Kentucky .....	41.00 to 46.00
Illinois-Missouri .....	35.00 to 45.00
Fire Clay Brick, Second Quality, Per 1000	
Pennsylvania .....	\$35.00 to \$45.00
Ohio and Kentucky .....	25.00 to 35.00
Illinois and Missouri .....	30.00 to 35.00
Silica Brick, Per 1000	
Pennsylvania .....	\$40.50 to \$50.00
Chicago .....	45.50 to 55.00
Birmingham .....	46.50 to 51.50
Magnesite Brick, Per Net Ton	
9 x 4½ x 2½ in. ....	\$80.00 to \$85.00
Chrome Brick, Per Net Ton	
9 x 4½ x 2½ in. ....	\$80.00 to \$90.00
Bauxite Brick, Per Net Ton	
55 per cent. ....	\$40.00 (base)
76 per cent. ....	100.00 (base)

#### Safety Codes in Steel Industries

The National Safety Council is preparing a safety code for blast furnace operation. The American Foundrymen's Association and the National Founders' Association are co-operating in preparing a foundry code; the Association of Iron and Steel Electrical Engineers will be asked to submit its code on cranes for adoption as a national standard. The actual formulation of the codes will be made by the American Engineering Standards Committee. These are phases of a general movement to bring about greater safety in industry.



# Mr. Campbell Praises Representative Plan

President of Youngstown Sheet & Tube Co. Believes in It Despite Experience of Strike Period and It Will Be Continued—Improved Relations of Employer and Employees

IN his report for 1919 to stockholders at the annual meeting, Feb. 10, President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, Ohio, stated that the company is entirely satisfied with the representation plan for employees now in effect at the corporation's plants. It has been a big benefit both to the company and the men, he stated, and would have worked to greater advantage during the steel strike had the men been more fully alive to its merits. Mr. Campbell points out that the plan, which gives workers a voice in determining their wages and working conditions, is not calculated to prevent major strikes, but will act as a deterrent against minor disorders. It was in effect nine months at the Sheet & Tube Co. plants when the strike started, and its benefits were not fully apparent to the men, many of whom preferred to listen to outside agitators, instead of their own representatives, whom they helped select. Through this plan many minor disputes have been settled, states Mr. Campbell, and workmen have not hesitated to present grievances as provided under the system. It has helped clear away many misunderstandings, he states, and has been instrumental in solving many minor problems affecting the individual workmen.

## Has Not Lost Faith

The strike did not cause the management to lose any faith in the plan, Mr. Campbell emphasized, but rather helped to disclose some of its latent possibilities. For instance, he points out that shortly after the strike began the representatives met of their own volition, and without any urging from the company condemned the strike as unwise and contrary to the best interests of the men. Resolutions were passed emphasizing the fact that working conditions were satisfactory and deploring the disorder as wholly unprovoked.

It has already demonstrated its effectiveness in paving the way for a better understanding between the company, through its foremen, superintendents and department heads, and the men themselves, and in settling disputes that might lead to more serious consequences. One of its essential provisions is that the plan may be abrogated from Jan. 1, 1920, by notice of either party, but Mr. Campbell states there is no intention on the part of the company to take such action and none on the part of the men, so far as he knows. Majority vote of employees at a special election called for that purpose may terminate the plan.

When the system was first put into effect at the works there was some doubt as to whether the men would avail themselves of the opportunities it afforded for settling grievances, for fear that they might endanger their jobs. This doubt prevailed, despite the fact that every safeguard was thrown around such procedure. Time has proved that this fear was ill-founded, as the men have not hesitated to present their claims, whenever they felt they had a just claim.

Officials point out that the interest disclosed at the election of representatives last December, for the second time, is an indication that the men themselves have faith in the system and in its efficacy. Spirited campaigns were conducted by some who aspired to be representatives. One of the salient provisions regarding election is that a representative must be an American citizen. Election is by secret ballot and is conducted entirely by the men, with such assistance in the use of facilities as the company may give.

## An Important Provision

It is expressly stipulated in the plan that acting as an employees' representative shall not in any way embarrass an employee in his relation to the company,

regardless of any action taken by him "in good faith in his representative capacity." The plan does not in any way abridge or conflict with the right of an employee to belong to a labor union and this provision is strictly enforced by the management. No man is barred from employment because of such affiliation, and on the other hand, his union membership does not entitle him to any special privileges. When labor leaders sought to arrange a conference with the company officials during the strike they were informed by President Campbell that the company dealt with its workers through the representation system and not through unions and that its policy in this respect would be continued. The Sheet & Tube company is an "open-shop" concern in every department, and does not recognize the Amalgamated Association of Iron, Steel and Tin Workers, though its puddlers and sheet mill employees are paid according to the same scale as union operatives in competing mills.

Regulations provide in detail for election of representatives to act with the management in enforcement of the plan. Each 300 employees in a department have one representative, while departments having a less number have one representative and any having more shall be entitled to additional representation for each major fraction in excess of 300.

Unusual provisions for arbitration of differences that may arise between the men and the company, and which cannot be adjusted by the ordinary methods, are provided. In event the management and employees' representative fail to agree, each shall choose an arbitrator who in turn shall select a third. In case the two arbitrators cannot agree on a third, the presiding judge of the United States district court for northern Ohio shall become the third arbitrator and "the decision of any two of the three arbitrators thus chosen shall be final and binding on both parties." Thus far it has not been necessary to invoke this privilege.

Officials and representative workmen are emphatic in declaring that the arrangement is fulfilling its function to "provide effective communication and means of contact between the management and men on matters pertaining to industrial relations and to insure justice, maintain tranquility and promote the common welfare."

## President Campbell Addresses Employees

President Campbell has issued this statement on the representation plan to employees:

"Our representation plan was established in order that every man in the works might be able at any time to secure a hearing, through some fellow workman he personally knows, with the management and that suggestions and requests concerning conditions of employment might be presented by anyone without even the suspicion that he would be criticised for doing so. In an organization so large as ours there is no other way that this is possible. None of the executives can know all the workers in the plant as they once could, even if their time was not fully taken up with other matters.

"Your representatives are chosen by you from among your fellow workers. They are or should be your friends, and they are expected to present to the management any grievance you have, as well as to insist that such grievances, when they are real, are remedied. If you go to them freely, anything you may have to say will get to the management and receive attention at once.

"Frequently injustice and wrong conditions are the result of misunderstanding or a lack of information. If they are cleared up it is better for all concerned. Most of our troubles come from the fact that we do

not know one another and do not trust one another as we should.

"Speaking for our executives in the operating department, I know they would like to be able to meet the men in the mills oftener and know them better. For myself I wish to say that while it is no longer possible for me to keep in touch with the men in the mills, any man in our works who feels that he is not fairly treated can come to me at any time and he will receive every consideration. But those who may think that they have reason for complaint should first take the matter up with their representative, whose business it is to see that any cases of unfairness or injustice are brought to the attention of the management.

"It should be borne in mind, however, that the company cannot always do what those who work in the plant may think ought to be done, or even what the management itself might like to do, because our plant must always be kept in a competitive position with others in the same line. If, for instance, we should be asked to do things that would increase our production costs so that we should be unable to sell our products in the open market at a profit, we should be compelled to refuse such a request, because, if granted, it would be equally bad for the company and its employees. Further, the company must be able at all times to earn more than its regular dividends in order to do the things that are necessary to the protection and contentment of its employees, as well as to make such repairs and improvements as are needed to keep the plant up to date and enable us to manufacture our products in competition with others in the same line. Unless the company is prosperous we who work for it cannot expect to be prosperous or to have steady employment.

"Already much good has come from the representation plan. Its possibilities in this direction are almost without limit if the men will use it as they should. They may rest assured that they can do this without hesitation or fear of criticism. In fact, the man who places before the representative of his department any suggestion or complaint will be recognized as a better man than the one who nurses a grievance, either fancied or real, and goes about his work dissatisfied himself and making others dissatisfied.

"I would therefore urge everyone in our organization to have absolute trust in the representation plan, make use of it when they think they should, and thus bring out for free and open discussion conditions which they think are not right. If we all do this there will be no real dissatisfaction of any kind and everyone will feel better because of the conviction that we are all working together and what is good for one is good for all."

#### Figuring on Wage Advance

Youngstown, Ohio, industries expended \$7,539,488 in wages in January, which compares with \$8,562,491 in January, 1918. Total wage distribution in 1919 approximated \$82,000,000.

District steel accounting departments have been engaged the past two weeks figuring the wage increase for semi-skilled and skilled men, effective from Feb. 1. The advance will affect all wage earners in the industry except employees in puddle, sheet and tin mill departments who are paid the sliding scale of the Amalgamated Association of Iron, Steel and Tin Workers.

Members of the Amalgamated Association declare the proposed increase lays the foundation for an advance in the tonnage rate of puddlers, heaters, rollers, roughers and other members of the crew when the scale comes up for consideration at the annual wage conference in June.

#### Housing Organization at Baltimore

To solve the housing problem at Curtis Bay, a large industrial section of Baltimore, and to give the thousands of employees an opportunity to deposit their savings and build their own homes, the industries have completed the formation of the Curtis Bay Industrial Building Association, Inc. It will have capital stock of \$1,000,000 and will be entirely under the control of

the various industries. There will be 36 directors, who will include four from the Baltimore Car & Foundry Co., three from the Curtis Bay Copper & Iron Works, four from the Davison Chemical Co., four from the Union Shipbuilding Co., three from the United States Industrial Alcohol Co. and four from the United States Industrial Chemical Co. Among the officers elected are E. Eiselt, Baltimore Car & Foundry Co., treasurer, and W. H. B. Elliott connected with the same company, secretary.

#### Had to Keep Forces Intact

Independent attitude of labor, especially foreign-born workers, is causing employers in the Youngstown, Ohio, district difficulties in keeping their forces intact and in getting certain kinds of more or less disagreeable work performed. On the threat of quitting, men frequently refuse to do work assigned them. The department manager of a machine shop has found girls adepts in certain machining operations where the work consists principally of superintending a lathe or some other machine and has built up a force of Finn girls. He says they are more regular than men, are more careful in their work and more ambitious. He insists that he will hire girls and women for all operations they can do.

An example of the general situation in the district is the demand of the lathers' union in the building trades that the amount of lath a man should drive be reduced from 1500 to 1400 a day. It is a well-known fact among building contractors that on a great deal of work lathers would be able to drive as many as 2300 lath per day.

It is predicted the outside labor rate in construction this summer will be not less than 60 cents an hour. Some contractors believe they will be compelled to pay 75 cents.

#### A Patriotic Poem

The Walworth Mfg. Co., Boston, is sending out a circular which is proving popular with the manufacturing companies. It is entitled "Some Remarks from Dan McGann" and includes a poem of highly patriotic character by Edgar A. Guest, ending with the following stanza:

So tip your hat to the flag like that! Thank God for its stripes an' stars!  
Thank God you're here where the roads are clear, away from your kings and czars.  
I can't just say what I feel today, for I'm not a talkin' man;  
But first an' last, I am standin' fast for all that's American.  
So don't you speak of the bolsheveek; it's sick of that stuff I am.  
One God, one flag, is the creed I brag! I'm boostin' for Uncle Sam!

The company has received requests for the circular from companies to tack up in their manufacturing plants. L. F. Hamilton, manager of sales promotion, says: "It occurs to us that if there were more Dan McGanns who would preach this doctrine there would be fewer 'isms' abroad in the land to-day." What do you think?

#### Conference Making Progress

WASHINGTON, Feb. 17.—Progress is being made by the President's industrial conference in the completion of its final report. Hearings have been held for several weeks, at which prominent men in the industrial world have expressed their views. The hearings have been secret, and not even stenographic reports have been taken, in order that the witnesses might be certain to speak their views freely.

Witnesses before the conference have included William Howard Taft, Samuel Gompers, Daniel Willard, and others of equal prominence.

A preliminary report made public by the conference several weeks ago recommended the creation of an industrial court for the settlement of disputes between capital and labor. It was stated at that time that the recommendations were tentative and offered with a view of receiving criticisms. The hearings held during recent weeks, it is understood, have resulted in various modifications of the original scheme. It is expected



that the final report, however, will retain the essential features of the plan outlined originally.

Representative Tinkham has introduced a bill in the House which provides that whenever a board or commission shall be created with a view to investigation of industrial or labor matters, it shall include a clear majority of representatives of the public.

### Considering Labor Problems

HARRISBURG, PA., Feb. 18.—Pennsylvania iron and steel men are active in the conference of superintendents of Pennsylvania industries, men connected with the employment branches of various corporations and managers of employment agencies, which opened here on Tuesday in answer to the call for a conference issued by Commissioner of Labor and Industry C. B. Connelly.

More than 400 such persons are in attendance at the conference, which was called by Commissioner Connelly to discuss the labor situation. The idea is to obtain the suggestions and ideas of people most concerned with maintenance of forces and the getting of employees.

"The time has now come in Pennsylvania when unskilled as well as skilled labor is unprecedentedly scarce and the cost of labor turnover is unduly high," says the commissioner. "The State Bureau of Employment needs suggestions and advice from the larger employers who are directly interested in this problem. It is something that is confronting industry in this State, and the bureau is trying to do what it originally was created to do. The idea is to render quicker and more specific service to both employer and employee."

### In the Field of Labor

Labor shortage was discussed by William H. Barr, president National Founders' Association, in a recent interview obtained by the Inter-Racial Council. He estimates that employers in the United States have spent in help wanted columns and otherwise more than \$30,000,000 hiring help away from one another in the past year. Immigration authorities at New York, he adds, say that 1,125,000 foreign-born workers and their families will leave for Europe as soon as conditions permit, and they estimate the 1920 immigration at one-third of the normal pre-war figures. "As the situation exists to-day," he said, "we are about 4,000,000 workers short, due to the dwindling of immigration. The situation of which the farmers complain—the luring of their help to the cities—has resulted."

Patternmakers employed by a number of jobbing shops in Cincinnati have recently decided to go on a "vacation," and as a result a number of shops are running short handed. It is understood that no demands have been made on the employers.

In order to minimize the employment of labor in Cincinnati by outside agencies, an ordinance has been passed by the City Council providing for the licensing of keepers of intelligence and employment agencies and compelling them to pay a fee of \$50 before taking labor from the city. Penalty for a violation has been fixed at \$300.

Labor unrest in Japan is mentioned in a recent report from Commercial Attache J. F. Abbott, Tokio, Japan. In nearly all cases a demand has been made for more wages, usually because workmen desire a participation in "the enormous profits that most of the big companies are making." Japanese workmen are given to soldiering, and as the Japanese workman does not over-exert himself at any time, according to Mr. Abbott, the prospects of the Japanese manufacturer are not reassuring.

The Timken Roller Bearing Co., Canton, Ohio, has made an advance of approximately 10 per cent in the wages of all day laborers in its tube plant and steel mill. About 800 men are affected.

The Joliet Rolling Mill Co. bar iron mill at Joliet, Ill., owned since March, 1913, by Frederick Cowan & Co., Inc., Chicago, has been closed and raw material stocks on hand have been sold. The plant is also on the market.

### Houghton Malleable Castings Co. Will Build

Ira L. Houghton, Toledo, Ohio, formerly president and general manager of the Maumee Malleable Castings Co., Toledo, has organized the Houghton Malleable Castings Co., with an authorized capital of \$500,000, and will locate in Toledo upon a 25-acre tract exceptionally well adapted for a plant of this kind.

The construction of the first unit covering about 150,000 sq. ft. of floor space, in which three 35-ton air furnaces will be built, also core and annealing ovens will be commenced in early part of March. The buildings are to be of latest type steel and glass construction, detailed plans for which are now in course of preparation by Harry W. Wachter, architect and engineer, under supervision of Mr. Houghton, who has been associated with the malleable industry for over 25 years in purchasing, sales, production and management, and is now the president and general manager of the new company with office at 965-966 Spitzer Building, Toledo.

New equipment throughout will be required and contracts will be placed as early as possible after building contracts are let.

### Reorganization of O'Neil Iron Works

Buffalo interests have purchased and will hereafter operate the O'Neil Iron Works, Inc., having an extensive machine shop, foundry plant and engineering works at Perry and Chicago streets and the Lehigh Valley Railroad, Buffalo, for the manufacture of sugar mill machinery. The plant has heretofore been controlled by John F. O'Neil and associates of St. Louis, pioneers in the sugar mill equipment industry, who established the Buffalo plant Nov. 1, 1917, by acquiring the Lake Erie Engineerng Works at the location stated, which had one of the best equipped machine shops in the state. The new president of the O'Neil Iron Works, Inc., is John M. Hull. The new vice-president and sales manager is W. D. O'Neil, who has had many years' experience in the sugar mill line. Walter V. Houck, formerly connected with the Garvin Machine & Tool Co. of New York, the King Sewing Machine & Separator Co., the Sterling Engine Co. and the Metal Goods Co. of Buffalo, is vice-president and general manager.

### Marting Iron & Steel Co. Reorganized

By the purchase of the stock of the Marting brothers of the Marting Iron & Steel Co., which operates blast furnaces at Ironton, Ohio, a considerable interest has passed out of the hands of that family. The purchasers were Carmi B. Thompson of the Tod-Stambaugh Co., Cleveland; Corlis E. Sullivan, president the Superior Savings & Trust Co., Cleveland, and Charles B. Fowler, manager of operations of the Marting Iron & Steel Co. The purchase price was not disclosed, but it is reported to be in the vicinity of \$160 per share.

At a meeting of the directors of the company, held at Ironton on Wednesday of last week, Mr. Thompson was elected chairman of the board, and Mr. Sullivan treasurer. C. B. Fowler, formerly superintendent, has been made manager. The Marting company was organized in 1899 by the late Col. Marting with a capitalization of \$2,000,000.

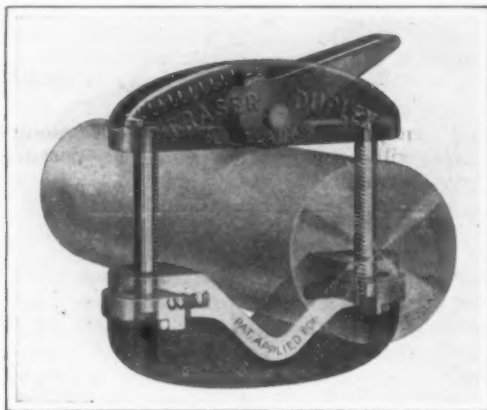
Directors of the company are not inclined to discuss the deal, merely giving out the above information. It is understood that no radical changes will be made in the policy of the company.

### Purchases Baltimore Company

The Blaw-Knox Co., Pittsburgh, has purchased the C. D. Pruden Co., Baltimore, manufacturer of standard steel buildings for industrial plants, warehouses, cottages and garages. J. Grier Campbell, purchasing agent of the Blaw-Knox Co., has resigned to become assistant treasurer of the C. D. Pruden Co. William S. Boyd, formerly assistant treasurer of the Crucible Steel Co. of America, and later purchasing agent of the Page Steel & Wire Co., Pittsburgh, has resigned to become purchasing agent of the Blaw-Knox Co.

### Self-Clamping Lathe Dog

A dog designed for use in connection with either a lathe or a grinding machine has been brought out by the Fraser-Duplex Mfg. Co., 1224 West Sixth Street, Cleveland. It has two jaws, supported on two posts, with a tail, or driver, fitted in the upper jaw and an eccentric that acts as a clamp for the work. Adjustment for work of different size is made by raising or lowering the bottom jaw, which is provided with locking plates to hold it in the desired position on the posts. To insert work the dog is held in the left hand and a forward pressure of the thumb on the driver causes the eccentric to move in the direction opposite to the pull of the spring connected to the driver, thus opening



This Lathe Dog Eliminates Screws or Nuts for Clamping. There are no projecting parts, and it is stated that the cam grips the work without marring it

the dog to receive the work which is inserted as in other types of dogs. Then the pressure on the eccentric is released and the work placed on centers. The dog is self-clamping, the grip increasing as the pull on the driver and eccentric increases.

The work is removed from the centers with the right hand, then the dog with the left hand, leaving the latter in a proper position for receiving the next piece of work. To change from one size of work to another the locking plates on the bottom jaw, which are held in place by a spring, are pressed together, thus to relieve the jaw, which may then be moved to any adjustment desired.

Advantages claimed for this dog are that there are no screws or nuts used for clamping, screw loss is eliminated, there are no set screws to become twisted or upset, a wrench is not needed, the clamping is obtained by a rolling motion which does not mar work and it has a safety feature in that there are no projecting parts. The dog is made of drop forgings and bar steel.

### Program of Iron and Steel Electrical Engineers

A joint technical session of the Pittsburgh section of the Association of Iron and Steel Electrical Engineers and the American Institute of Electrical Engineers will be held in the Hotel Chatham, Pittsburgh, on Saturday, Feb. 21. A paper will be presented on "Manufacture and Use of Graphic Recording Instruments" by Professor J. W. Esterline, the Esterline Co., Indianapolis. The paper is to be illustrated with lantern slides, covering the different features of instrument design, construction and use. Other meetings of the Pittsburgh section scheduled and speakers to be presented are as follows: March 20, "Babbitt and Babbitting," by T. D. Lynch, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; April 17, "Grounded Neutral," by Robert B. Treat, electrical engineer, General Electric Co., Schenectady, N. Y.; May 22, "Inspection of One of the Largest Steel Plants in the State of Ohio," further details later; June 12, "Current Limit Reactance," by R. H. Keil, power engineer, Jones & Laughlin Steel Co., Pittsburgh.

The Philadelphia section of the American Iron and Steel Electrical Engineers is to meet in the Engineers' Club in that city on March 6. Walter C. Kennedy, op-

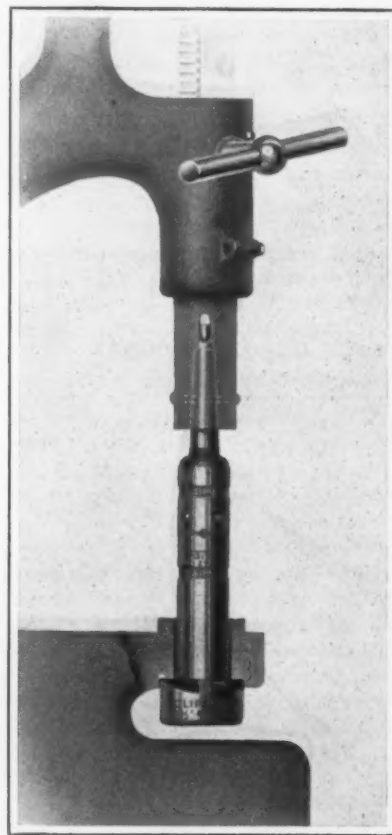
erating engineer of the Worth Steel Co., Claymont, Del., will present a paper on "Control of Blooming Mill Tables and Screw Downs."

The Cleveland section will meet in the Union Electric League rooms in the Hotel Statler, that city, Saturday, Feb. 28. E. S. Lammers, assistant electrical superintendent, National Tube Co., Lorain, Ohio, will present a paper on "Automatic Control of Electrically Operated Blooming Mills."

### Interchangeable Inverted Counterbore

An inverted counterbore, designed for counterboring and facing inaccessible surfaces which cannot be readily counterbored in the usual manner is being manufactured by the Eclipse Interchangeable Counterbore Co., Detroit. The illustration shows the counterbore with pilot-shank having a patented drive at the upper end and suitable for inserting into a standard Eclipse holder.

The counterbore is first inserted into the holder and the top surface counterbored, then it is detached and the inverted pilot-shank inserted into the holder, lowered through the hole and the inverted cutter attached, ready for counterboring the under side of the hole. This is emphasized as being accomplished without removing the holder from the machine. In addi-



Inverted Counterbore for Surfaces Which Cannot Be Readily Counterbored or Faced in the Usual Manner

tion to the patented drive, the inverted counterbores are furnished with both straight shanks and Morse taper shanks.

That part of the counterbore pilot-shank which is directly above the cutter acts as a pilot in the hole of the article to be counterbored. The pilot-shanks are classified and numbered according to the diameters of the pilots. The length of the pilot varies from 3 to 6 in., according to the diameter. The inverted counterbore is interchangeable; that is, many cutters may be used with each pilot-shank, and many sizes of pilot-shanks may be used with each cutter.

Truss-cleats for use on kegs, barrels and buckets are being manufactured by the Hubbard Pressed Steel Co., Niles, Ohio. They are made in sizes from 9½ to 20½ in.



# Industrial Relations

## Breaking Ground

Short Talks on Vital Questions by One of Experience

*This is the fourth of a series of articles on Industrial Relations by Thomas Stanion, director of safety, Aluminum Manufacturers, Inc., Cleveland, formerly the Aluminum Castings Co. It indicates the close contact of the author with the employees.*

"My men don't appreciate what I do for them and I'm through with any more welfare work," said a prominent manufacturer recently. We cannot question the honesty and sincerity of his intentions in the effort that had seemed to fail, nor dare we say that the men did not want improved conditions and better relations with their employer. Somewhere along the line his program had failed in its execution—perhaps the employer had held it on a welfare, rather than a sound business, basis—and the whole proposition was to be cast aside. In principle this manufacturer believes heartily in affording his men every consideration that rightfully is theirs, and when he finds the proper method for putting this belief into action, his company will be enthusiastic over the results. Another manufacturer of long experience who, in the old days, had been through many wrangles with his employees over wages, hours and conditions—differences that arose just as sure as the recurring seasons, and which, although costly, had been peaceably settled, came at length to this plan, explained in his own words: "Whenever I sit down with my men to adjust a difference, I always begin by asking for the one point or points on which both sides agree, so that we can start from a common ground of understanding. From that we take up progressively the things on which we are at variance."

Any ventures in employees' industrial relations is sure to be confronted promptly with the problem of solving differences of opinion—perhaps very real differences affording a test of the stability of the plan and calling for an expression of the faith which the company has in its ultimate success. Let's recall for a minute the work and the goal of Industrial Relations efforts;—to provide a dignified means of communication and definite contact between management and men. Mutual confidence is a prime requisite for, unless each party believes firmly that the other is presenting the whole truth in the matter—plainly and without distortion to suit present needs, absolutely no progress will be made. We must not overlook the fact that in the past management has sometimes presented conditions so as to create a false impression; and, equally true, employees have exaggerated conditions. All of this must be supplanted by a bed-rock of mutual trust before any advance can be made. The means or manner by which management approaches its men becomes of great importance. It is the foundation on which the entire structure is to be reared, and is of vital importance, for it shows the mutual confidence existing between men and management. Great pains then can well be taken at this step, for just as a skyscraper will stand or fall with its foundation, so our employee problem efforts will come through or fail with the confidence in existing relations between the company and its men.

There are companies fortunate in enjoying the loyalty and confidence of their men through all ordinary circumstances. This good will has been

acquired in a variety of ways and will enable such a company to launch a plan affording its employees a voice in definite phases of management with a feeling of assurance that it will be taken for what it is worth and without wilful misrepresentation. Happy is that company which enjoys such standing. However, there are concerns which have no such substantial basis, and for them the breaking of ground becomes the first step in the problem—a step whose goal is to gain the confidence of the employees as a body before undertaking these larger questions of mutual interest. Some means is needed whereby such a company can demonstrate clearly its good intentions, and show beyond question that the desire for the employees' co-operation is real and permanent. Ordinarily some activity in which little is involved will serve best, for it is easier for us to repose confidence in such a case rather than where much is at stake.

Recent years have developed many activities in which the employees have had a measure of control, or carried on by the company as distinctly employees' affairs. The desire of the employer to surround his men with good influences and add some interest to his employment apart from the routine of the shop has prompted many of these. Any one of these efforts can be made the background on which to build a comprehensive plan of employees' industrial relations. A partial list of such activities might be: Employee Benefit Association; Co-operative Stores; Recreation and Education; Restaurants; Home-building; Safety First; Trade Training. All of these activities are apart from the routine production program and concern themselves primarily with the human equation. They are means through which the men in our shop can be encouraged to efficient, loyal service—means by which the good will of the employee can be had and held. True a company can operate and produce goods without any of these activities, but properly conducted and adapted, they are of their own merit, well worth while. More important is the fact that they are the beginning of, and mark a distinct step toward, the better mutual understanding and consequent good will in our industrial world which is to help capital and labor realize that they have a common goal and that each must approach it unselfishly.

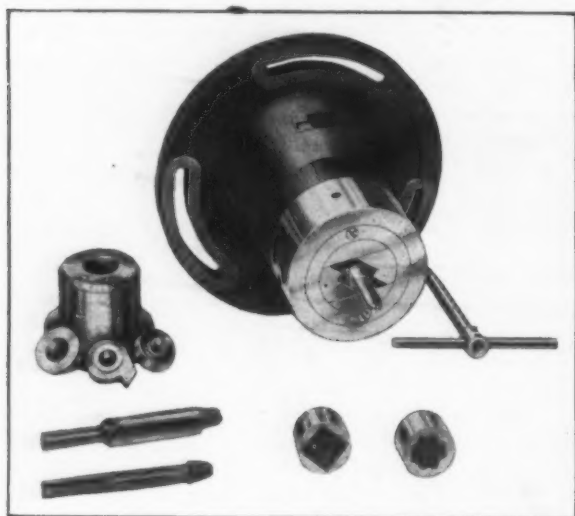
Freyn, Brassert & Co., engineers, People's Gas Building, Chicago, have made arrangements with the Gellert Engineering Co., Philadelphia, for the mutual handling of Cottrell electrical blast furnace gas cleaners for the entire world. Freyn, Brassert & Co. will have exclusive charge of sales and will co-operate with the Gellert Engineering Co., which is the exclusive builder of the Cottrell cleaner in the United States in the installation and practical adaptation of this apparatus to the particular requirements of blast furnace practice. The Cottrell gas cleaner is of the dry type and functions by means of electrical windage, giving no back pressure and entailing no loss of sensible heat. It is at present in successful use in this country and abroad.

## Device for Drilling Square Hole Direct

An attachment that will drill a square hole in one operation in metal or other substance out of the solid material, and without previous preparation, is being marketed by the Fairbanks Co., Broome and Lafayette streets, New York. It is known as the Radbore head, and is for attachment to mill machine or drill press.

The operation of the device is on the principle of the Cardan circles. Points 1-2-3 of the line drawing indicate a cross-section of the shank of the drill which is shown in the accompanying illustration. It is rotated inside a square guide as indicated by the outside lines. If cutting edges are ground on the end of the drill, they will sweep across the surface of the square with rounded corners. Hence if the drill is fed into the material, it will cut out the square hole with filleted corners.

To make a hole with sharp corners, a shank as indicated by points 1, 2, 3 and 4 in the second line drawing,



Square Holes Are Drilled Direct by This Radbore Head, an Attachment for the Milling Machine or Drill Press

having one cutting edge longer than the others, is used; the longest cutting edge going into the corners to square them.

The drills have a positive drive from the spindle of the machine and the cutting lips follow a path determined by the adjustable jaws of the head, so that no preliminary round hole is necessary. The cutters are explained as being so designed that there is no material in the bottom of the hole which is not removed by the cutting edges; therefore blind square holes can be obtained in one operation and without any subsequent finishing.

Radbore heads or chucks are manufactured in four sizes and two different styles, the range of drills,  $\frac{1}{8}$  to 2 in., being as nearly equally divided between the four chucks as possible. Drills for filleted corners are manufactured from  $\frac{1}{8}$  to 2 in. by sixteenths, and drills for square corners from  $\frac{1}{8}$  in. to  $1\frac{1}{4}$  in. by sixteenths.

## Legislation of War Minerals

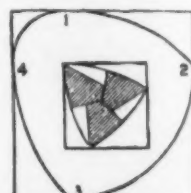
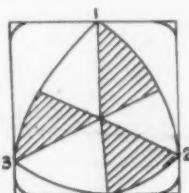
WASHINGTON, Feb. 17.—Legislation is pending before Congress which would make possible more liberal treatment of producers of war minerals specified in the act of March, 1919, under which their reimbursement for losses was authorized. Hearings have been held during the past two weeks by the House Committee on Mines and Mining, on a resolution introduced by Representative Garland of Pennsylvania, chairman of the committee, directing the War Minerals Commission appointed by Secretary of the Interior Lane to place a more liberal construction upon the act; under which producers of tungsten, chrome, manganese and pyrites may be reimbursed for their losses incurred through their efforts to respond to the Government call for greater production of minerals needed in the war. Attorney General Palmer has ruled that only those producers who were personally requested by Government officials to undertake a program of greater pro-

duction can be reimbursed. The pending Garland resolution directs the commission to recognize claims of those who responded to the published appeals for greater production, even though they were not specifically requested to do so by Government officials.

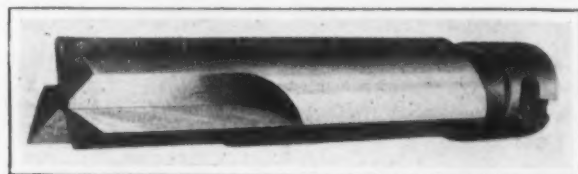
The act of last year appropriated \$8,500,000. The claims approved by the commission have approximated \$418,502. The claims filed under the act totaled \$16,665,481. The claims filed totaled 1203. Of these 731 have not yet been acted upon; 442 were disallowed entirely, while 30 were partially allowed. The amounts claimed in these 30 cases totaled \$1,399,112, which were reduced by the commission to \$418,502.79.

## Disposing of Machine Tools

WASHINGTON, Feb. 17.—There will be few if any surplus machine tools remaining when existing contracts and authorizations under legislation are carried



Points 1-2-3 Indicate a Cross-Section of the Drill Shown Below, Which Makes a Square Hole with Filleted Corners. Points 1-2-3-4 indicate the shank of a drill used for making a hole with square corners, one cutting edge being longer than the others



out, according to present prospects. The War Department surplus under the present program will be taken care of chiefly in four ways. One is under the contract with the French Government for the purchase of \$25,000,000 worth of machine tools, selections of which are now being made by a French commission which is in this country; another is an arrangement with Belgian manufacturers who are expected to take about \$7,000,000 worth; the third manner in which the tools will be disposed of is under the Caldwell law, which authorizes the War Department to sell its surplus tools to technical schools and colleges at 15 per cent of cost; and the fourth is under legislation now pending in Congress for the turning over of a part of the tools to the Federal Vocational Board. Some tools are also being used by the Army Vocational Board.

Seven hundred schools have responded to the questionnaire sent out under the terms of the Caldwell law. Coupons totaling 3300 have been sent out following receipt of the answers to the questionnaire to 300 schools.

Up to date the War Department has turned over to the Federal Trade Board of Vocational Education surplus tools and other equipment valued at \$250,000.

## Cleveland Companies Consolidated

The Consolidated-Iron, Steel Mfg. Co., Cleveland, has been organized to take over the plants of the Republic Structural Iron Works Co., Columbian Hardware Co. and Taylor & Boggis Foundry Co., Cleveland. Each of the three companies will retain its corporate identity. The Republic and the Columbian companies have been controlled for several years by the same interests, and these interests acquired control of the Foundry company about six months ago. I. T. Kahn, president of the associated companies, will be president of the new company, and other officers are members of the present organization. H. F. Seymour, R. J. Dickey and F. Blondell will be vice-presidents and Joseph Lehman will be secretary. The new consolidated company will have a capital stock and surplus of over \$3,000,000.



## RIGHTS OF THE PUBLIC

### Unions Show Disposition to Disregard Them in Railroad Controversies

WASHINGTON, Feb. 17.—While the threatened railroad strike has been averted, the feeling prevails that a permanent settlement of the controversy is not yet in sight.

One point which might easily escape attention in a casual reading of the correspondence between President Wilson and the executives of the railway unions possesses more than ordinary significance. It was the insistence of the union men upon a method of arbitration which takes no cognizance of the rights of the public. While the labor attitude was not stated in this negative way, it was none the less plainly indicated.

In response to the very general assurances of the President that he would take steps to urge the railway corporations to establish some sort of a wage adjustment machinery if no legislation along this line is enacted, the union executives announced their intention to submit to their organizations the question of the creation of a board with full power to map out a comprehensive adjustment of wages which would be binding upon carriers and employees signing an agreement to abide by the findings.

#### Public Ignored

The significant feature of the program as thus advanced was an express provision that this board should be composed of an equal number of representatives of the roads and the employees. It is noted that nowhere in the President's letter is there any statement indicating his approval of a board made up in this manner.

Members of Congress and public men generally have become increasingly impressed recently with the need of creating labor adjustment boards on which the public shall have the final say. This sentiment found expression in a resolution introduced not long ago in the House by Representative Tinkham of Massachusetts providing that a clear majority of the members of any boards of this nature shall be composed of representatives of the public. Mr. Tinkham pointed out that in boards made up of three members the representatives of capital and labor usually fixed up an agreement between themselves and the third person representing the public had nothing to say about it. In the case of boards with an even number of members, divided equally between labor and capital, there either is a deadlock and no settlement of the controversy or else some sort of a deal is made which is satisfactory to both of the parties to the dispute, the result usually being an increase in wages, which is passed along to the public. The public has no recourse.

#### Why Dr. Garfield Resigned

It was his insistence upon the rights of the general public which led to the resignation of Dr. Harry A. Garfield as fuel administrator. Dr. Garfield was not consulted in the President's appointment of the coal commission which is now at work. This commission is composed of three members, one representing the coal operators, one the miners and the third the public.

The full significance of the statement of the railway union executives is seen when the history of railroad legislation is recalled. The Esch bill, as reported from the House Committee on Interstate and Foreign Commerce, provided for a wage adjustment appeals board to be appointed by the President. Organized labor vigorously opposed this provision of the bill and succeeded in having the House amend the bill on the floor by the substitution of what is known as the Anderson-Sweet amendment. This amendment provided for a continuation of voluntary wage adjustment boards such as were set up by the Railroad Administration. These wage adjustment boards were to be composed of an equal number of representatives of carriers and employees and no appeals board was provided. Nowhere was there provision for participation of representatives of the general public.

The compromise bill as finally agreed upon yesterday by the conferees of the Senate and House, while dropping the anti-strike provision of the Senate bill, restores the appeals board which the House saw fit to strike out from the original Esch bill, but it is provided that the board shall be composed of nine members to be appointed by the President, equally divided among employees, employers and the public. While this wage adjustment tribunal would have nothing to do with freight and passenger rates, under the section of the bill providing for a 5½ per cent return on the railroad investment the Interstate Commerce Commission would be obliged to raise rates as a result of wage increases.

#### Will Try to Defeat Plan

Organized labor does not like this appeals board as provided in the conference bill and will exert its influence to the utmost to defeat it.

An evident attempt to forestall action by a board of this sort is seen in the request made by the labor leaders that the President at once appoint a board composed of an equal number of representatives of the two elements. The conference of representatives of labor organizations, which has been called to meet on Feb. 23, will be asked specifically to pass upon the proposition of having such a board start work upon appointment by the President to adjust wages in this particular controversy on a basis of rates of pay for similar or analogous services in other industries, to decide the relation of rates of pay to the increased cost of living, to provide a basic minimum living wage sufficient to maintain a railroad man's average family upon a standard of health and reasonable comfort and to fix differentials above the basic minimum living wage, giving due regard to skill required, responsibility assumed and hazard incurred. This tribunal, according to the proposal by the union executives, would hand down its decision within 60 days after its appointment to be final and binding upon all railroads in the United States and upon the employees.

The President did not say in his letter that he would appoint such a board. What he did say was that in the event of legislation providing machinery for dealing with railroad wage matters he would use his influence and so far as such law conferred power upon him would promptly exercise that power to bring about the earliest practicable organization of the machinery thus provided. In the event of failure to enact such legislation, he said he would use his influence with the railroad corporations and employees to have machinery of this sort established. Just what sort of machinery he would advocate, he failed to say. It seemed clear from his letter, also, that he had no intention to go ahead and create a board in advance of action by Congress or in spite of it, as the labor chieftains appear to desire. The President did give assurance that he would appoint a committee of experts at once to collect and analyze all available data, but there was no intimation that this committee would have any authority or would do more than furnish information to the President and to such a board as might be created later.

It is manifest that the railroad companies are not going to agree to be bound by the action of any such board as proposed by organized labor if legislation is enacted creating other tribunals.

Sponsors for the wage adjustment plan in the railroad bill as approved by the conferees of the Senate and House rely upon public sentiment to prevent strikes following the award of the appeals board. It is argued that after a case has been decided by the lower tribunal and then by the appeals board, employees would have slight chance for sympathy from the public if they went on strike. Labor leaders realize the force of this theory apparently, judging from their opposition to the enactment of any such legislation.

Molders of Worcester, Mass., have just put in demands for \$1 an hour, and it is reported that molders in other near-by cities are about to place similar demands.

ESTABLISHED 1855

# THE IRON AGE

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## Steel Presidents and Labor Problems

In an address of which liberal extracts are printed elsewhere in this issue, Robert H. Irons, president of the Central Iron & Steel Co., Harrisburg, Pa., discusses labor problems in the light of an intimate experience with the subject. He is convinced that as long as one man profits by another's labor and as long as corporate greed and varying degrees of personal integrity continue, the labor question will remain unsolved, but he is optimistic and believes that through evolution some method will be found to bring about a more equitable distribution of profits. He shows the difficulty of various profit-sharing plans and points out that profits should not be considered in connection with wage rates, as the lack of profits is not the fault of labor, and if wages cannot be increased in harmony with the increase in living costs, he believes it would be better for the country if in that particular industry the plants were closed down and the workmen compelled to go to some profitable employment. We believe, however, it is pertinent to inquire what substitute could be found for the product needed even if the manufacturer had little profit.

Referring to the breaking of the steel strike, Mr. Irons does not hesitate to give credit to the right-thinking, patriotic, two-fisted American workmen who, when fully informed as to the character of the leaders of the strike, went back to work even at the risk of their lives.

Touching on the establishing of employee representation in numerous plants, Mr. Irons refers to the fact that in plants where various plans of this kind were in effect, the men went out on strike, and he is not at all convinced that any system of employee representation is a success. It is, as he says, too soon to judge finally on this subject, but evidence continues to accumulate that the employers who are trying the plans are not discouraged but intend to continue in the direction in which they have started. We referred recently to the annual report of the Colorado Fuel & Iron Co. in which President Welborn expressed his faith in the Colorado plan. In another column of this issue of THE IRON AGE the opinion of President Campbell of the Youngstown Sheet & Tube Co. in regard to the employee

representation plan in that company's works is given. Mr. Campbell does not hesitate to express himself in his usual vigorous style. He believes that the plan of co-operating with the men in a representative capacity has accomplished much good, and he has no idea of giving it up. He points out that the plan was intended primarily to prevent local trouble and was not expected to prevent men going out in the case of a great national strike. He might have added, however, that if employers and employees come into such cordial relations that numerous minor strikes can be avoided, it is not too much to hope that in time the workingmen will be unwilling to go out and will positively refuse to do so in the case of such a strike as has just been witnessed under the leadership of Foster and his associates.

In view of the doubts still held as to the value of employee representation, the opinions of Presidents Welborn and Campbell are calculated to help considerably in definitely determining whether or not this scheme of industrial relations should be given wider trial.

One of the best points of Mr. Irons' address is his assertion that the average man is not as good a citizen now as he was during the war. When the war was raging, it was comparatively easy to be patriotic. Many who by working or by making sacrifices served their country when the armies were in the field are not standing the test of the reconstruction period. We join Mr. Irons, however, in expressing faith in the common sense and patriotism of the average American, and believe that he will emerge from the clouds of discontent a better citizen and a better worker.

## The Ferromanganese Situation

The decline in the output of American ferromanganese in 1919 of nearly 50 per cent of that of 1918, as analyzed elsewhere in this issue, is due to several causes. The falling off was from 345,300 gross tons in 1918 to 179,000 tons in 1919. Uncertainty as to the future needs of the alloy and the fact that probably large stocks caused a rapid recession in values are two factors which limited output. The most important one is per-



haps the expectation late in 1919 of severe competition from British producers which, without doubt, caused American makers to cease laying in stocks of ore or increasing the output of the alloy. From a monthly production of about 21,000 tons in the first quarter, the production fell to 14,900 tons per month in the last quarter of 1919, with the December output only 11,200 tons.

It seems now that this fear of British competition would have proved unwarranted. While in 1913 British makers furnished 50 per cent of the American consumption, and while it was thought possible they might repeat this in 1919 or 1920, in order to do so they would have to have normal supplies of ore. Our analysis referred to shows the rather astonishing fact that while in 1913 British manganese ore imports were 50,000 tons per month, in 1919 they were only 22,150 tons per month. This is the lowest in seven years and less than the American imports of 27,700 tons per month last year.

These facts help to explain the present high prices of ferromanganese. The American industry has already exhibited considerable of a recovery. For January of this year THE IRON AGE statistics show that the output reached over 18,000 tons and the prospects are that this will be larger in the next few months. The likelihood of British competition in the near future is not strong. It seems demonstrated that if British imports attain a rate of 3000 tons per month and our own production reaches 21,000 tons per month this year, our needs will be met on the assumption that our steel ingot and casting production reaches a total of 42,000,000 tons in 1920.

A striking feature of these statistics is the great decline in spiegeleisen production. This fell in 1919 to only 5450 tons per month or the lowest in many years. In 1913 it was over 10,000 tons and in 1918 over 20,000 tons per month. In view of the heavy export demand for this material, particularly from Germany and Holland, output from now on should increase.

The remarkable record made by the American manganese-iron alloy industry during the war was one of the outstanding features of the steel industry's contribution to the war's success. Nothing should be left undone to maintain this industry even to the extent of a tariff on one or both of these products, should such be found necessary.

### Copper in Steel

The beneficial effect of copper in certain steels seems to have been demonstrated by the metallurgical and testing division of the United States Navy. It is stated that in some of the steels the copper content ran as high as 2 per cent. Some of the nickel steel made by the gun factory has been running from 0.40 to 0.70 per cent copper and with proper heat treatment and manipulation these steels are reported as showing decided superiority to most steels free from copper. It is the experience also that when properly made there has been no greater degree of red-shortness than in copper-free steels of similar history. One cause for success in attaining these results is precaution in preventing the copper from liquating or

separating during solidification. This is partly accomplished by insuring a higher manganese content than when copper is not present. This is also claimed to prevent the tendency to red-shortness. In this connection it is of value to cite the experience of certain American converter steel foundries. Some of these have been making a fairly high sulphur metal containing up to 1 per cent copper. Their results show not only no increased tendency toward red-shortness, but the physical properties are considerably benefitted. Here, too, the manganese content was above normal. Copper may yet find a place among alloy steel-making metals.

### Pre-planned Engineering Meetings

In recent years quite a change has come over the conduct of engineering societies so far as the character and scope of the papers submitted is concerned. It used to be the practice that papers were written largely as matters of personal inspiration and voluntarily submitted without more than general urging. It was not necessarily that the material was not available, but there was no special direction in the selection of subjects or authors.

Nowadays there is quite a little planning. Not only are general topics selected in point of the special interest at the time, but authorship is made almost an obligation. The different technical societies have accordingly not remained merely the repositories of the spasmodic records of individual achievements in widely scattered lines of endeavor, but they have come to be the collecting agencies of substantially all that it is seemingly possible to divulge on the lively subjects of the day. Some of our engineering society meetings indeed will provide for several sessions, each devoted to a topic of vital timely interest.

It is unnecessary to enumerate what have been the results in concrete cases. The necessity for pooling interests and information in the period of the war had much to do in accelerating the movement, but the way had already been paved. Some of the conspicuous examples of the value of pre-planning the character of a given meeting are contained in the records of societies concerned with iron, steel and metal working. A monumental monograph on blast furnaces requested a few years ago for the American Iron and Steel Institute was followed by a series of papers by specialists, until the whole collection is probably the most comprehensive and most valuable ever written on the subject. The fifty or more papers obtained for its last fall meeting by the American Institute of Mining and Metallurgical Engineers on pyrometry are in such great demand that they are now being prepared for publication in book form. Similar statements could be made for specific meetings of the American Society of Mechanical Engineers, for example, and the American Society for Testing Materials, and others.

There are signs that another series of notable papers will be secured by the American Iron and Steel Institute following out the outline of problems which confront the design of open hearth furnaces and makers of open hearth and Bes-

semer steel given in the paper by Dr. Henry M. Howe, reviewed elsewhere in this issue.

The undeniable success of the pre-planning of engineering meetings is assurance that the methods will be continued. The result undoubtedly will be that not so much time will elapse as used to be the case before the making of an actual engineering study and its publication. It is also likely to give the engineering world more of the results that are not illogically regarded as the private

property of the company for which the engineering work was done, or, in other words, there may not be quite so long a jealous and an unnecessarily long hold on information which would help industry as a whole as well as the individual company itself. The continued concentration on problems of the day by technical organizations speaks well for keeping the nation in a position of pre-eminence in matters which admittedly concern the general well-being.

## HOG ISLAND SHIPYARD SOLD

### Shipping Board Purchases Property from the American International Corporation

The American International Corporation has sold the Hog Island shipyard, operated by the American International Shipbuilding Corporation, to the United States Shipping Board. The American International Corporation was paid \$1,900,000 and interest for the real estate, \$1,900,000 having been the original purchase price. The corporation also receives \$2,000,000 as compensation for the cancellation of 80 ships shortly after the signing of the armistice. Within a few weeks the ships now being built at Hog Island will be completed and the property, with all buildings and equipment, will be turned over to the Government.

No announcement has come from Washington as to what disposition will be made of the property, but it is assumed that it will be offered for sale. There is an agitation in Philadelphia in favor of the purchase of the land by the city for port development. It would ideally be suited for this, as the water front is equipped with docks and there are large wet basins suitable for the repair of ships.

## Fuel Conditions in New England

While the fuel situation in New England is serious, owing to freight embargoes brought about by recent snows, etc., no iron and steel industries in that section have been obliged to suspend operations. Some concerns are running along on small rations of fuel, but manage to keep plants active.

At one time, for instance, it was believed that the General Electric Co. foundry in Pittsfield, Mass., would be obliged to close for lack of fuel, but a car was received in time to tide the management over until further supplies were available. The Richmond Iron Works, Richmond Furnace, Mass., pig iron, has 10 cars of charcoal on the way, but very little on hand, yet is managing to operate, turning out 14 tons of iron per day.

All of the New England railroads have issued priority lists. E. K. Hubbard, president of the Manufacturers' Association of Connecticut, has received the following telegram: "Railroad Administration has ordered that coal billed for New England go through for 72 hr. with priority over all freight." All of the large machine tool manufacturers in the western part of Massachusetts have enough coal on hand to last a week or more or secure their power from electric companies. In and about Boston the only manufacturing establishments which have closed for a day or longer during the past week have been those which were unable to ship their product.

## Will Show Industrial Zones

The Federal census of manufactures and mines and quarries is now under way and by March 1 a large field force will be engaged in collecting these statistics. The gathering of the data which the Census act requires regarding the manufactures and mines and quarries of the country is under the immediate supervision of Eugene F. Hartley, the Census Bureau's chief statistician for manufactures.

"A special feature of this census," states Mr. Hart-

ley, "will be the presenting of the statistics of manufactures by industrial zones. In former census years statistics of manufactures have been presented geographically by states and by cities of 10,000 population and over, with a supplemental exhibit for from 12 to 15 metropolitan districts. The general trend shown by large industrial enterprises seeking suburban locations, where the necessary space and adequate switching facilities may be secured at reasonable cost and without taxation at city rates, has created a new condition. To reflect this industrial expansion the Census Bureau at the current census will show as a third geographical unit the industrial zone. The 69 largest manufacturing localities, those embracing a population of 100,000 and over, or practically those manufacturing sections representing \$100,000,000 of manufactured products, have been selected for a special presentation as 'industrial zones.'"

Approximately 1200 special agents will be employed by the Census Bureau to do the necessary field work.

## Steel Treathers Establish a New Chapter

The Lehigh Valley Chapter of the American Steel Treathers Society was established late in January, with headquarters at Easton, Pa. The first meeting was held on Jan. 30, at which W. H. Eisenman, secretary of the national society, addressed an attendance of over 150. The new chapter starts with a membership of 100. John E. Halbing, assistant superintendent of heat treating, Ingersoll-Rand Co., Easton, is chairman of the new chapter, and Albert P. Spooner, metallurgical engineer, Bethlehem Steel Co., Bethlehem, Pa., is secretary-treasurer.

## Manganese Ore from the Caucasus

According to *L'Echo des Mines*, the government of the Georgian Republic has concluded an agreement with the manganese mines of Tchiaturi under which the monopoly of exportation of the ore for a period of 10 years is given to a company to be constituted by the mine owners. The company is to be known as the Société Industrielle d'Exportation de Manganèse, and is to have its headquarters at Tiflis.

## Metal Trades Convention

The next convention of the National Metal Trades Association will be held at the Hotel Astor, New York, Wednesday and Thursday, April 21 and 22. The executive council meeting and secretaries' dinner will be held the preceding Monday and the council meeting and meeting of the local branch secretaries and alumni dinner Tuesday.

## New Electric Steel Casting Plant

The Alloy Electric Steel Casting Co., Warren, Ohio, has been incorporated with a capital stock of \$150,000. John Jacob Coxey and other Massillon, Ohio, men are interested. The company plans to erect a plant for the manufacture of electric steel castings.

Bulletin 710-E of the U. S. Geological Survey, "Deposits of Manganese Ore in Southeastern California," gives a short discussion of the local economic factors that bear upon the industry and notes on the kind, use and quantity of the ore and the production.



## THE SCRAP SITUATION

### Reasons for Slight Weakness Which Has Developed in Past Ten Days

The scrap market is often regarded as an uncommonly good barometer of conditions in the iron and steel industry; hence the slight weakness in scrap prices during the past 10 days has excited more than usual interest. Therefore, the views of a leading scrap-handling company on the situation, quoted as follows, are of value:

We have had during the past 10 days an unprecedented situation of the market in steel scrap weakening, when we have a condition of an entire country being tied up with snow and ice so that it is almost impossible to make shipments, and we attribute this to the following two reasons:

*First and foremost*, we find a disposition on the part of dealers who have been holding steel scrap in their yards for some time, to want to make sales, and on investigation we find that this has been caused entirely by the banks, which have notified these dealers that they expect them to dispose of the scrap in their yards (which show a good profit) rather than to borrow more money to hold for additional profits. We find this condition quite general in every section, showing what looks like a concerted action on the part of bankers. This has caused these dealers to make the sales regardless of the fact that they cannot move the scrap.

*Second*, owing to the fact that the mills are not receiving their shipments of coal which is due first to scarcity of cars and second to weather conditions, the mills have not been able to operate properly.

*Stocks of Scrap.* The only stocks of steel scrap in the country are those that are stored in dealers' yards and this does not amount to any great tonnage for the reason that the dealers have been storing only since February or March of 1919. In other words, the consumption of steel scrap up until the armistice in November, 1918, was tremendous, and owing to the fact that the Government had a maximum price on same, there was no benefit in the dealers storing scrap, and consequently everything was shipped as fast as possible. After the armistice, dealers had sufficient orders in hand at high prices to take care of their shipments until possibly January or February of the year 1919. The only time scrap accumulates in dealers' yards to any great extent as a storage proposition is in times of low consumption at the mills. When the price gets below a certain point, the dealers immediately start to stock up and hold for higher markets. We have had this low consumption period by the mills for the period only from Jan. 1 to July 1 of 1919, and therefore the storage stocks accumulated in dealers' yards apply only for that period.

*Railroad and Industrial Steel.* Owing to the fact that the railroads have been spending as little money as possible, they have consequently not been renewing rails or cars and, therefore, the percentage of scrap made by the railroads has been very small and will continue to be so until they start to spend money for repairs and new equipment.

Due to the hold-up in the production of finished steel owing to the steel and coal strikes, the mills consuming this finished steel did not get their supplies and are still not getting them, and this means that the production of scrap by these mills has fallen far below normal.

*Consumption.* Owing to the fact that the price of basic pig iron is from \$13.00 to \$15.00 per ton higher than the price of No. 1 steel scrap, the mills which formerly used a mixture of 60 per cent pig iron and 40 per cent scrap have now turned this mixture around, and are using 60 per cent scrap and 40 per cent pig iron, and will continue to do so as long as there is such a vast difference between the price of scrap and pig iron. The condition of order books of the mills is such that they have enough business on their books or in sight to run them for at least a year, and when the railroad situation is cleared up, it is figured that the railroads alone will need enough iron and steel to run the mills solid for one year. We, therefore, look for a tremendous consumption of steel scrap with constantly advancing prices until the large gap between the price of steel scrap and pig iron is closed.

In addition to this, steel mills that formerly made steel by the duplex process are not operating their duplex furnaces to as large an extent as usual owing to the fact that it pays them better to make the pig iron and sell it on the market and buy their scrap for use in their furnaces instead of running the hot metal into the furnace. This has caused an increased consumption of steel scrap in eastern Pennsylvania alone, of at least 30,000 tons per month.

## CONTENTS

Developments in Brass Melting.....	527
President Irons Discusses Labor Problems.....	531
Dr. Moldenke on Fundamentals.....	533
Supplies of Ferromanganese.....	534
Exports of Metal Working Machinery.....	534
Modern Foundry for Aluminum Castings.....	535
New Line of Automatic Stop Alligator Shears.....	540
Engineers Discuss Alloyed Aluminum.....	540
Progress in Industrial Personnel.....	541
The Solvay Thrift Plan for Industrial Employees.....	543
Making a Factory Newspaper.....	544
The Open-Hearth Furnace and Processes.....	545
Refractories Advance Ten Per Cent.....	546
Mr. Campbell Praises Representative Plan.....	547
Labor News.....	548-549
Marting Iron & Steel Co. Reorganized.....	549
Self-Clamping Lathe Dog.....	550
Interchangeable Inverted Counterbore.....	550
Industrial Relations—Breaking Ground.....	551
Device for Drilling Square Hole Direct.....	552
Legislation of War Minerals.....	552
Disposing of Government Machine Tools.....	552
Railroad Labor Controversies.....	553
<b>Editorials:</b>	
Steel Presidents and Labor Problems—The Ferromanganese Situation—Copper in Steel—Pre-planned Engineering Meetings.....	554-555
Hog Island Shipyard Sold.....	556
Fuel Conditions in New England.....	556
Federal Census of Manufactures and Mines.....	556
Metal Trades Convention.....	556
The German Iron and Steel Trade.....	558
The Iron Industry of Italy.....	559
China's Commerce Reduced.....	559
Iron and Steel Markets.....	560
Youngstown Mill Operations.....	573
January Steel Ingot Output.....	573
Mining Engineers Elect Herbert Hoover Their President.....	573
American Chain Acquires Page Steel & Wire Co.....	573
British January Iron and Steel Output.....	573
Non-Ferrous Metals.....	574
Prices Finished Iron and Steel f.o.b. Pittsburgh.....	575
Personal.....	576
Obituary.....	576
Koppers Co. Secures Large Contract.....	577
Handling Machinery Manufacturers to Meet.....	577
Association of American Steel Manufacturers' Meeting.....	577
Structural Business Active in January.....	577
Machinery Markets and News of the Works.....	579
New Trade Publications.....	589

The interest in the Griswold-Eshleman Co., advertising, Cleveland, formerly held by A. W. Hammond, has been purchased by C. L. Eshleman and the name of the Griswold & Hammond Co. has been changed to the Griswold-Eshleman Co. Mr. Eshleman is vice-president of the Union Metal Mfg. Co., Canton, Ohio, and has a long and successful record in sales management and advertising work. He was summoned by the Government during the war to speed up production work in the central district and was later commissioned a captain in the Ordnance Department, United States Army.

According to the New York office of the National Founders' Association there have been fewer strikes among foundry employees throughout the country so far in 1920 than in any other six weeks' period since America entered the war. In the spring it is expected that a flurry of demands for higher wages will be presented, some of which will probably be followed by strikes.

On Feb. 11 the molders in several foundries of Columbus, Ohio, went out over demands for \$7 for an 8-hr. day and for strictly union shops. At present they are receiving \$6 daily.

# The German Iron and Steel Trade

Sold Months Ahead with No Bright Outlook  
for Expanding Production—Prices Still Advancing—Amalgamation of Companies a Feature

(Special Correspondence)

BERLIN, GERMANY, Jan. 22.—This month the iron trade has been much occupied with reports of impending fusions of various kinds. About the beginning of the year it became known that the great wholesale iron firm of Otto Wolff, Cologne, had acquired a large or probably controlling interest in the Phoenix Co. of Hoerde, which also has a branch establishment at Ruhrort, the great coal shipping port at the mouth of the river Ruhr. The Cologne firm had already obtained a controlling interest in the Rheinische Stahlwerke of Meiderich, which adjoins Ruhrort. Wolff had also gotten a controlling interest, as was reported, in the Van der Zypen Co.

As the first two of these companies are very strong concerns it was assumed that Wolff must have a powerful financial backer; and conjecture at once fastened upon Krupps. Reports accordingly were soon spread that a great trust, with Krupps as nucleus and dominating force, was about to be formed. This turned out to be a mistake, however, and now it appears that Wolff was acting for himself. It is mentioned that he has been for several years the selling agent of both Phoenix and Rhein-Stahl, besides having imported great quantities of Swedish ores for them during the war; and in these operations he made big money. A big new combination is accordingly being formed by him, which will doubtless play a big part in the west-German iron trade during coming years.

Another version of these negotiations, so far as affects Phoenix, comes in the form of a Stockholm dispatch to the *Frankfurter-Zeitung*. It reports that the big Swedish ore company, which holds claims of 120,000,000 Swedish crowns against Germany for ores bought during the war, has transferred its claims to the Rotterdam firm of William Mueller, which is backed by American capital. The dispatch goes on to say that this Dutch firm intends to buy up the Phoenix Co. One of the Stockholm papers also stated that Americans were also acquiring claims against Upper-Silesian companies for ores delivered by Sweden.

About the same time it was reported that Peter Klöckner of the Hasper Co. was in negotiations with the Gutehoffnungshütte looking to an amalgamation or community of interest arrangement, which should prove a sort of counter trust to Wolff's concern. Another report has it that the Bochumer Verein is also taking a hand in the fight, which apparently is particularly hot for the control of Van der Zypen. Up to the present moment, however, no definite result of all these projected fusions has been announced.

Another group of fusions is in course of construction in the Siegerland region. The movement there is due partly to the compulsory selling out of German concerns in French Lorraine; and partly to the fact that some of the big Rhenish steel companies, having lost their ore deposits in former German Lorraine or in the Briey district, are now turning to the Siegerland district to buy ore mines to make good their loss.

Some weeks ago August Thyssen, one of the great Rhenish operators, who opened a new steel mill in Lorraine only a few years before the war and lost it recently through the peace settlement, bought a controlling interest in the Friedrichshütte (steel plant with ore mines). Now it is announced that the Lothringer Huetten und Bergwerks Verein Aumetz-Friede has annexed the Geisweider Eisenwerke in the Siegerland district. The latter, besides having ore mines, operates two blast furnaces and an open hearth steel plant. The Aumetz-Friede concern has also for several years held joint control of the Pfannenberger Einigkeit mine, which is the most valuable iron mine in the Siegerland

region. Other efforts are reported to buy ore properties in that district.

## Still Higher Pig Iron Prices

The chief event of the month in the trade itself has been a further sharp advance of pig iron prices, which went into effect two weeks ago. The advance is all the more remarkable considering that it follows upon another big raise made as recently as the beginning of December, which was duly reported to THE IRON AGE. That advance ranged between 249 marks for spiegeleisen and 436 marks for hematite. Already on Jan. 8 new prices were listed. The increase ranges between 251 marks for spiegeleisen and 547 for hematite. Here are the new prices, as compared with two previous dates:

	Before War	Jan. 1, 1919	Jan. 8, 1920
Hematite pig iron...	79.50 m.	314.50 m.	1718.50 m.
Foundry pig iron....	75.50	250	1324.50
Siegerland steel-iron.	69	240	1077
Siegerland spiegeleisen	79	254	1146

Of course, the greater part of the increase is to be accounted for by the huge depreciation of the German mark.

About the same time a further big rise in old iron and scrap material was registered, as the result of the increasing difficulties in the way of importing foreign ores. Only so recently as about the beginning of December prices rose to 900 or 1000 marks, but already they have further risen to around 1400 marks, with some sales above that figure. The tendency of prices is still upward.

While no changes in heavy steel products (semi-finished material, rails and structural forms) have been made this month, there has been much talk of further increases in price. The strong tendency has been stimulated by the action of the German works in the Saar district, now under the control of the French; they raised their prices two weeks ago on an average 755 marks a ton above those of the Steel-works Association, evidently seeking to bring their prices more into harmony with those prevailing in France.

To-morrow a readjustment of the prices of bars is to be made, and some of the works have proposed advances ranging between 500 and 1000 marks. It is expected that an average increase of about 750 marks will be adopted, which would bring the price up to about 2500 marks.

## Outlook for Increased Production Not Bright

The state of the trade remains substantially as reported in previous letters by me, though the demand for goods as well as the difficulties of production appear to have been further intensified. The deliveries of both coke and ores at the furnaces have been further restricted owing to labor troubles and disturbed transportation; and a considerable number have had either to bank their fires or blow out. The outlook for increased production, moreover, is by no means bright. Last week it looked as if a general strike of railway operatives in the great industrial region of the lower Rhine was about to break out, resulting from partial strikes at various important centers. This danger has now passed off for the time being; but the coal workers are insisting upon enforcing the 6-hr. day at the end of January, which threatens to aggravate the coal famine to a great degree.

Moreover, other causes are working in the same direction. Now that the peace treaty has gone into effect the French commission that has been watching over the coal industry will insist upon Germany's be-



ginning to make larger shipments of coal to France. It is also becoming evident that heavier shipments of coal must be made to German farmers, in order to enable them to thresh their grain; also to industries closely related to agriculture, like sugar factories, potash mines and nitrogen plants. All this opens dark prospects for the iron industry. Another recent trouble of the iron trade is that ocean freights have been sharply raised on ore shipments. In the Silesian district complaint is heard that foreign ore prices have enormously risen. While considerable amounts of Swedish ores are arriving there, none are coming in from other countries.

#### Steel and Iron Sold Months in Advance

Most of the German iron companies have orders in hand running months ahead, and they are not disposed to take new orders except with rather indefinite terms in respect to periods of delivery. It is mentioned, for example, that orders for the thinnest plates (under one millimeter) can hardly be placed for delivery under 8 or 10 months. The scarcity in these numbers has been intensified through the dropping out of the Saar mills. Consumers of such goods are readily paying a premium of 1000 marks above list prices on goods for immediate delivery. Much of the same situation prevails in respect to heavier plates, bars and rods. Further price advances are talked of as likely.

A further increase of coal prices by 7.50 marks at the beginning of the month is being used as an argument for higher steel prices.

It was recently reported that the negotiations between the Economic Minister and the leading men of the iron trade had led to an agreement more or less in harmony with the plans of the minister, as reported in my last letter. A self-governing organization of the trade is contemplated, each member of which will be under obligation to observe the prices fixed by it. One part of the project is that ore imports are to be paid for with exported iron and steel. The works also undertake the obligation to supply the home market. Further details are expected to be made public soon.

#### Production of Heavy Products

The annual report of the Steel-works Association for the year ended June 30, 1919, has just been made public. Owing to the lateness of publication it will suffice here to give but a few of its details. The average daily shipments in semi-rolled material, rails and structural forms dropped to 5564 tons, as compared with 6931 tons for the previous year. The shipments in these goods for the year amounted to 1,697,040 tons (crude steel weight), or a decrease of 409,976 tons. Shipments to the home and foreign markets were made as follows:

	Home Trade		Exports	
	1918-19	1917-18	1918-19	1917-18
Semi-rolled products....	436,154	578,598	3,155	11,327
Rails and other track- age materials.....	759,727	1,006,165	56,184	41,807
Structural forms.....	402,397	410,714	39,425	58,405
	1,598,278	1,995,477	98,764	111,539

The exports of bars and bands dropped from 211,484 to 132,318 tons.

#### The Iron Industry of Italy

WASHINGTON, Feb. 17.—The iron and steel industry in Italy, which until recent years had been little developed owing to lack of coal and the small domestic production of iron ore, has now reached a position of the first importance in comparison with other Italian industries. This is stated by Trade Commissioner H. C. MacLean, who is at Rome, in a report to the Bureau of Foreign and Domestic Commerce. Mr. MacLean says that the rapid progress made by Italy during the war in this connection is remarkable.

"In the year 1900 Italy's production of steel was 115,800 tons, and of pig iron, 24,000 tons," says Mr. MacLean. "Although in general the production of iron and steel in other countries was reduced during the war, Italy's production of steel increased to 1,304,000 tons in 1917. The figures covering imports of iron

and steel products such as bars, plates, rails, pipe, etc., indicate the large extent to which Italy was obliged to supply its own needs. While the total amount of such products imported in 1915 was 500,000 tons, in 1916 imports reached only 220,000 tons, 550,000 tons in 1917 and 513,000 tons in 1918.

"In the year 1917, Italy produced about 600,000 tons of steel for munitions, or approximately one-half its total output. In spite of its deficiency in raw materials Italy's iron and steel industry has continued to grow, and while its position at present in the period of transition from war to peace activities, is a difficult one, there is no doubt that these difficulties will be overcome."

#### China's Commerce Reduced

WASHINGTON, Feb. 17.—Exchange conditions have had a bad effect on the import and export trade in China, according to Consul General George E. Anderson at Hongkong. Mr. Anderson says that in a general way the effect of the excessive value of silver in exchange has been distinctly bad. He points out that while there has been a certain amount of stimulation in imports since the Hongkong or Chinese dollar would buy so much more than usual, the high value of the metal has practically stopped all imports of a normal sort, and only commodities which have to be imported at almost any price have been going forward. Exports to the United States have held up remarkably well, probably owing largely to the fact that the American dollar is at a premium compared with the currency of most competing countries. Mr. Anderson says that the general showing of trade is distinctly bad, both by reason of the actual results in high exchange and for the uncertainties such unusual conditions have developed.

Regarding conditions in iron and steel, Mr. Anderson says:

"The iron and steel market also remains lifeless. The excessive stocks in most lines held over from last year have been pretty well disposed of, and the market is ready for new supplies when favorable conditions arrive, but with exchange and finance so uncertain nothing so far has been done, despite the fact that the high exchange should stimulate the buying of these supplies at this time. There has been some special demand for steel rods and trade in wire nails has been quite fair, especially in the smaller sizes. The tinplate situation has not changed, and there has been a small movement on yellow metal, lead, copper and other metals."

#### Moving Pictures in Great Britain

WASHINGTON, Feb. 17.—Steel manufacturers of Sheffield have joined in the production of moving pictures designed to aid in widening markets for British products throughout the world. Trade Commissioner Wilbur J. Page, who is at London, describes activities along this line in a report to the Bureau of Foreign and Domestic Commerce. The development committee of the Corporation of Sheffield has enlisted the interest of 37 steel and cutlery manufacturers of that district. The films which are being produced show Sheffield as one of the greatest steel, cutlery and engineering centers in Great Britain.

Industries of Birmingham, Glasgow, London and Liverpool are also developing the motion picture idea. What is known as the Moving Picture Exhibition of British Industries, Ltd., is promoting it.

#### The Manufacture of Tinplate in France

Before the war, according to *La Métallurgie*, the works of Hennebont of the Basse-Indre, and of the Campionnet Co., produced about 12,000 tons of tinplate each; Châtillon-Commentry and Montataire produced 6000 tons each, and, including some other smaller firms, the total production was well over 50,000 tons. At the present time only the Hennebont and the Basse-Indre works are making tin plates, and their output is not even sufficient for their own consumption. The Montataire and Campionnet works deliver only black plates.

# Iron and Steel Markets

## NO LET UP IN DEMAND

### Financial Conditions Alone Menacing

#### High January Steel Production—February Operations Seriously Curtailed by Car Shortage

The hand of cautious finance has shown itself here and there in the iron trade. It is directed chiefly to the effect on general business of exchange conditions and the disturbed money market and only inferentially suggests that care needs to be exercised in iron and steel commitments. Specific happenings in this connection in respect to iron and steel are too few to form a basis for generalization. Some suspension of steel shipments into Canada have been asked where it now takes 117 Canadian dollars to pay \$100 in American money, but even these are not necessarily cancellations. A leading reason ascribed to softness in scrap material is the disposition to call in loans now held on such material.

The outstanding facts in contrast are the continued insistent pressure from buyers, together with small stocks in the hands of consumers and much yet to be done to make up for the enforced curtailment of the war period.

The volume of business actually done has tapered off, but solely as the result of the refusal of mills to enter future delivery orders. Some further price advances have been registered, but they are not general. They represent negotiations successfully consummated by buyers. In a word, the iron and steel trade is convinced that even if a setback should occur, it will be of very short duration. It will amount to a mere halt to establish the healthy basis of trading.

The January steel production, using figures collected by the American Iron and Steel Institute for 84 per cent of the productive capacity, indicates that output was at the rate of 40,796,652 gross tons a year, or 84½ per cent of the best rate in 1918 and probably 83½ per cent of total capacity. The showing is better than was expected.

February steel production will show a decided falling off. The low movements of fuel due to railroad troubles have affected Eastern plants especially, one having half and another only two out of 22 open hearth furnaces in operation. In Pittsburgh ingot production is at about 80 per cent of capacity and in Chicago between 70 and 75 per cent.

The Chicago district stands out in pig iron buying activity. Agricultural implement making companies and companies connected indirectly with railroads have been the conspicuous buyers. A Michigan automobile manufacturer has bought 30,000 to 40,000 tons of foundry grades, some of which brought as high as \$42 Birmingham. Foundry iron is \$2 higher at Cleveland.

Prices of Eastern iron ore have been fixed in harmony with the recent advance in Lake Superior ores of \$1 per ton, the new Eastern price being 14.1c. per unit compared with 12.54c., the price which has prevailed for three years.

Railroad inquiries are beginning to develop.

The Great Northern has ordered 750 ore cars, the Soo Line, 500 box cars, the Grand Trunk is seeking 3000 automobile and 1000 flat cars. The Pennsylvania, for car repairs, is in the market for 10,000 tons of material and the Baltimore & Ohio for 5000 tons.

In shipbuilding, material is yet to be bought. A New York yard, for repairs, is in the market for 25,000 tons for hulls and 12,000 tons for boilers. In Philadelphia the needs of two yards exceed 10,000 tons of plates.

Fabricated steel business in January totaled 135,000 tons against an average in the last six months of 1919 of 138,600 tons. Large building projects are still a notable feature and were there not a shortage of other materials as well as steel, structural business would be overwhelming.

Manufacturers are combing warehouses vigorously for all kinds of finished steel, but with stocks of sheets, the smaller sizes of screw stock, wire, spring steel, coppered Bessemer rods, and many special products wiped out, relief from a worse shortage than existed during the war is problematical under existing conditions.

Production in Great Britain is on the increase. The output of pig iron in January amounted to 665,000 tons against 640,000 tons in December and a monthly average of 614,000 tons in 1919.

In the light that exchange checks exports is the rejection of bids for 22,000 tons of cast-iron pipe for South America, as well as a large tonnage for Cuba.

In tin plate probably 1,000,000 boxes are piled up in mill warehouses in Pittsburgh awaiting cars for shipment. As indicative of the shortage in sheets is the purchase of a carload in Seattle at 9.50c. for delivery in Cleveland.

Cast-iron pipe is \$3 higher in Chicago and 15,000 tons are wanted by that city.

Two separate wire cards are regarded as an early likelihood, some of the independent makers working up a set of extras different from those in use by the American Steel & Wire Co. The Steel Corporation's new wire mill at Duluth will have 300,000 tons annual capacity. Work is also under way there for sheet and tin plate mills.

## Pittsburgh

PITTSBURGH, Feb. 17.

The car situation is getting steadily worse, and is still further restricting output and shipments of material from the furnaces and mills. The Pennsylvania Railroad has just announced an embargo on all shipment east of Pittsburgh, except live-stock and food-stuffs, to be in effect for five days from 7:30 Tuesday morning. On one or two days in the middle of last week, the car supply was a little better, and many thousands of tons of finished steel products that were piled in mill warehouses were moved out, and transportation conditions were looking better. However, on Sunday and Monday very cold weather set in, the thermometer showing about zero, and this put the railroads in bad shape again, so that shipping conditions were worse. The railroads are unable to handle the business being offered them, not only in steel, but in general merchandise, and some heads of traffic departments of steel companies believe it will be many months before there is much relief. All the railroads are short of



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 17, 1920	Feb. 10, 1920	Jan. 20, 1920	Feb. 18, 1919
No. 2 X, Philadelphia...	\$45.35	\$45.35	\$44.35	\$36.15
No. 2, Valley furnace...	42.00	42.00	40.00	31.00
No. 2, Southern, Cin'tit...	43.60	43.60	43.60	34.60
No. 2, Birmingham, Ala.†	40.00	40.00	40.00	31.00
No. 2, furnace, Chicago...	43.00	43.00	40.00	31.00
Basic, del'd, eastern Pa.	41.40	41.40	39.25	33.90
Basic, Valley furnace...	43.00	43.00	38.00	30.00
Bessemer, Pittsburgh...	43.40	42.40	40.40	33.60
Malleable, Chicago*	43.50	43.50	40.50	31.50
Malleable, Valley	43.00	43.00	40.00	31.50
Gray Forge, Pittsburgh...	42.40	42.40	39.40	31.40
L. S. charcoal, Chicago...	57.50	57.50	47.50	38.85

Rails, Billets, Etc., Per Gross Ton:	Feb. 17, 1920	Feb. 10, 1920	Jan. 20, 1920	Feb. 18, 1919
Bess. rails, heavy at mill.	\$45.00	\$45.00	\$45.00	\$55.00
O.-h. rails, heavy, at mill.	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh...	58.00	52.50	48.00	43.50
O.-h. billets, Pittsburgh...	58.00	52.50	48.00	43.50
O.-h. sheet bars, P'gh...	60.00	58.00	50.00	47.00
Forging billets, base, P'gh.	75.00	75.00	64.00	56.00
O.-h. billets, Philadelphia.	64.10	59.10	59.10	47.50
Wire rods, Pittsburgh...	65.00	65.00	60.00	57.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	4.25	4.25	3.75	3.145
Iron bars, Pittsburgh...	4.00	4.00	3.50	2.90
Iron bars, Chicago...	3.50	3.50	3.00	2.92
Steel bars, Pittsburgh...	3.00	3.00	2.75	2.70
Steel bars, New York...	3.27	3.27	3.27	2.97
Tank plates, Pittsburgh...	3.50	3.50	2.65	3.00
Tank plates, New York...	3.77	3.77	3.02	3.27
Beams, etc., Pittsburgh...	2.70	2.70	2.45	2.80
Beams, etc., New York...	2.97	2.97	2.82	3.07
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.70
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.00
Steel hoops, Pittsburgh...	3.50	3.50	3.25	3.30

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.  
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Feb. 17, 1920	Feb. 10, 1920	Jan. 20, 1920	Feb. 18, 1919
Sheets, black, No. 28, P'gh.	5.00	5.00	4.60	4.70
Sheets, galv., No. 28, P'gh.	6.50	6.50	5.95	6.05
Sheets, blue an'd, 9 & 10.	4.25	4.25	3.55	3.90
Wire nails, Pittsburgh...	4.50	4.50	4.50	3.50
Plain wire, Pittsburgh...	3.50	3.50	3.25	3.25
Barbed wire, galv., P'gh.	4.45	4.45	4.45	4.35
Tin plate, 100-lb. box, P'gh.	\$7.00	\$7.00	\$7.00	\$7.35

Old Material, Per Gross Ton:	Feb. 17, 1920	Feb. 10, 1920	Jan. 20, 1920	Feb. 18, 1919
Carwheels, Chicago...	\$38.00	\$39.00	\$36.00	\$22.00
Carwheels, Philadelphia...	40.00	40.00	38.00	23.00
Heavy steel scrap, P'gh.	28.00	28.00	27.00	15.00
Heavy steel scrap, Phila.	25.00	26.00	25.00	14.00
Heavy steel scrap, Ch'go.	24.50	25.00	24.00	14.50
No. 1 cast, Pittsburgh...	34.00	34.00	33.00	19.00
No. 1 cast, Philadelphia...	39.00	40.00	38.00	23.00
No. 1 cast, Ch'go (net ton)	39.50	39.50	36.50	19.50
No. 1 RR, wrot, Phila.	36.50	36.00	34.00	20.00
No. 1 RR, wrot, Ch'go (net)	26.00	26.50	25.50	14.50

Coke, Connellsville, Per Net Ton at Oven:	Feb. 17, 1920	Feb. 10, 1920	Jan. 20, 1920	Feb. 18, 1919
Furnace coke, prompt...	\$6.00	\$6.00	\$6.00	\$4.25
Furnace coke, future...	6.00	6.00	6.00	6.00
Foundry coke, prompt...	7.00	7.00	7.00	5.00
Foundry coke, future...	7.00	7.00	7.00	7.00

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	19.25	19.25	19.50	17.50
Electrolytic copper, N. Y.	19.00	19.00	19.25	17.00
Spelter, St. Louis...	8.75	8.65	9.30	6.35
Spelter, New York...	9.10	9.00	9.65	6.70
Lead, St. Louis...	8.50	8.50	8.50	4.70
Lead, New York...	8.75	8.75	8.75	5.00
Tin, New York...	60.00	58.00	64.00	72.50
Antimony (Asiatic), N. Y.	11.62 1/2	11.50	10.75	7.12 1/2

motive power and cars and will have to do a good deal of financing before they are able to get new rolling stock, and this may require considerable time.

The upward movement in prices on pig iron seems to have come to a stop for the time being at least, but on billets and sheet bars and some finished steel products is still under way. Since last week, Bessemer iron has sold at \$42 at Valley furnace, and there have been further sales of basic at \$43, the price last week, but the movement in other grades of pig iron has been light.

Prices on sheet bars have reached \$60 or higher, billets are close to that price, and on some lines of finished steel prices are slightly higher. Production is not over 80 per cent of capacity in steel ingots, due to car shortage, slow receipt of coal and coke, and to some extent inefficiency of labor. The output of finished steel is probably about the same on the average, but unless car supply soon gets better, there will be a considerable falling off in output of iron and steel, as some large mills are on the ragged edge for coal, and will have to shut down in a few days, unless a supply is received. The situation seems to be worse in the Youngstown district than in Pittsburgh, but it is certainly bad enough here.

**Pig Iron.**—Inquiry for Bessemer iron is limited and basic is not so active as it has been recently, largely for the reason that most consumers that were in the market for iron have covered and not so much iron is wanted. The American Chain Co., which has just taken over the Page Steel & Wire Co., is credited with having bought about 5000 tons of Bessemer for its open-hearth steel plant at Monessen, Pa., the business going to a nearby furnace interest on the basis of \$43, Valley furnace, or \$44.40 delivered. We also note a sale of 2000 tons of standard Bessemer iron to a Washington interest at \$42 at Valley furnace. Sales of other grades of pig iron in the past week have been light, and only for small lots.

Many furnaces are feeling a shortage in coke and have a supply ahead for only a day or two.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh districts being \$1.40 per gross ton:

Basic	\$43.00 to \$44.00
Bessemer	42.00
Gray forge	41.00 to 42.00
No. 2 foundry	42.00 to 43.00
No. 3 foundry	40.50 to 42.00
Malleable, Valley	43.00 to 44.00

**Ferroalloys.**—Frequent sales are being made of domestic 76 to 80 per cent ferromanganese for last half of year delivery at about \$165 delivered. We also note some sales of 50 per cent ferrosilicon for last half of delivery at \$90 or higher, delivered.

We quote 76 to 80 per cent domestic ferromanganese \$165 for second half delivered, with a reduction of \$1.50 to \$1.75 per unit for lower percentages. We quote 50 per cent ferrosilicon at \$85 to \$90, and 18 to 22 per cent spiegeleisen at \$55 to \$57.50, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, \$56.50; 10 per cent, \$59.50; 11 per cent, \$62.50; 12 per cent, \$66.10. We quote 6 per cent silvery iron, \$45.75 to \$46.25; 7 per cent, \$50 to \$50.50; 8 per cent, \$52 to \$52.50; 9 per cent, \$54 to \$54.50, and 10 per cent, \$56.50 to \$57. An advance of \$3.30 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on Bessemer ferrosilicon, and an advance of \$2.50 per gross ton is charged for each 1 per cent silicon for 11 per cent and over on silvery iron. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which has a uniform freight rate of \$2.90 per gross ton for delivery in the Pittsburgh district.

**Billets and Sheet Bars.**—Prices on any available supply of billets or sheet bars for fairly prompt shipment continue to climb rapidly. It is said that sheet bars have sold for fairly prompt delivery at as high as \$65 maker's mill, and we note a sale of a considerable tonnage by an outside mill for extended delivery to a regular customer at \$60 at mill. A sale is also reported of about 1000 tons of soft open-hearth 4 x 4-in. billets at \$58, maker's mill. There is still an acute shortage in supply of sheet bars, and any mills that can spare some for fairly prompt delivery would have no trouble to get \$60, or possibly \$65 for them. Output

of billets and sheet bars, owing to shortage of cars, fuel and labor, is not running over 80 per cent of normal.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at \$58 to \$60; 2 x 2-in. billets at \$65; slabs, \$57 to \$60; sheet bars, \$60 to \$65, and forging billets, \$75 to \$80 base, all f.o.b. mill Pittsburgh or Youngstown.

**Structural Material.**—Some large jobs have been placed in the past week, and a very large amount of new work is being figured on, much of which is expected to be closed in the very near future. The McClintic-Marshall Co., in addition to the 16,000 tons for loft buildings for the Garment Center Realty Co. in New York, reported in THE IRON AGE last week, has taken a plate mill for the Glasgow Iron Co., Pottstown, Pa., 400 tons and a bank building for the Scandinavian National Bank at Tacoma, Wash., 2100 tons. We quote plain material up to 15 in. at 2.45c. to 2.70c., Pittsburgh, but both local interests naming these prices are practically out of the market as sellers. Sales of beams and channels up to 15 in. have been made by a mill outside of the Pittsburgh district at 4c. and higher.

**Plates.**—The demand is still very heavy, and even the smaller plate mills are getting filled up for some months. It is said that large shipbuilding interests have offered as high as 4c. for plates for fairly prompt shipment. The two leading local makers are out of it for this year, having absolutely all the plates on their books they can roll before the first of the new year. The Carnegie Steel Co. price on plates of tank quality, 1/4 in. and heavier, remains at 2.65c. Another mill has been selling until recently at 2.70c., but is out of the market, so that these two prices do not cut any figure as regards new orders being placed. The smaller plate mills are quoting 3.50c. to 4c. at mill, and seem to take all the business they care to take on at these prices.

We quote sheared plates of tank quality, 1/4 in. and heavier, at 2.65c. to 2.90c. for indefinite delivery, probably not before next year, while the active market prices of mills that will accept orders for delivery in three or four months range from 3.50c. to 4c. and higher at mill.

**Sheets.**—Output and also shipments of sheets are being held up by shortage in steel and also in supply of cars. This week the American Sheet & Tin Plate Co. is operating to about 80 per cent of sheet mill capacity, but some of the larger independent mills are not doing so well, owing to shortage of cars and steel and inefficiency of labor. Premiums of \$20 to \$25 per ton for fairly prompt delivery of sheets are still being offered by several of the larger consumers in order to obtain fairly prompt delivery. In the prices given below, the lower figures named are those of the leading interests for indefinite delivery and the higher prices are those of some of the independent mills, which in some cases promise delivery in two or three months from date of order.

We now quote No. 28 gage box annealed, one-pass black sheets at 4.35c. to 5.35c.; No. 28 galvanized, 5.75c. to 6.75c., and No. 10 blue annealed at 3.55c. to 4.50c., the lower price named being the March 21 schedules.

**Tin Plate.**—The shortage in supply of cars is playing havoc with shipments of tin plate. At present the American Sheet & Tin Plate Co. has between 500,000 and 600,000 boxes of finished tin plate piled up in its various warehouses ready for shipment to its customers, but for which it cannot obtain cars. On one day last week, the Jones & Laughlin Steel Co. had over 70,000 boxes piled in its warehouses at Alliquippa, awaiting cars, and reports from other leading tin plate mills show the same conditions. No early relief is in sight. Some days the car supply is fair and then for two or three days practically none will be supplied. This shortage in cars is cutting down output, as some tin plate mills have about reached the limit of storage facilities, and will have to reduce output of tin plate until the car supply is better. The export demand is fairly active, coming mostly from Japan, local inquiry at the minute being for close to 100,000 boxes for that country. It is very evident that a good deal of tin plate sold for first half will not be delivered until probably the end of the first quarter, owing to reduced production of output by nearly all the mills. We quote tin plate for domestic consumers

at \$7 per base box, wasters being \$7.50 to \$8, and tin plate for export ranges in price from \$9.50 to \$10 per base box, all f.o.b. Pittsburgh.

**Wire Rods.**—There is still a very active inquiry for rods but two local mills say they have stopped selling, needing their entire output for their wire mills. There will be no trouble whatever in selling soft rods at \$65; in fact \$67 has been done, and it is possible \$70 would be paid if fairly prompt delivery would be made by the mill. For soft Bessemer or open hearth rods \$52 is the price of the leading interests, but all other mills are quoting from \$65 to \$67 at mill. We note a reported sale of 500 tons of soft rods, Bessemer or open hearth, at option of the mill at \$67 at mill. High carbon rods range from \$75 to \$100 at mill, depending on the carbon content.

**Wire Products.**—It now seems likely that in the near future there will be two separate wire nail cards in the market, one from the independent mills and the other from the American Steel & Wire Co. Three or four of the independent mills are at work on the new cards, and the leading interest is also getting a new card ready. There will be radical changes in the extras, some being slightly reduced but most of them advanced to meet increasing costs. Mills continue to report a very heavy demand for wire nails and for all kinds of wire, including fencing. Output is already reduced to some extent by the shortage of cars, some mills having very heavy stocks piled up, awaiting cars for shipments. We continue to quote wire nails at \$3.25 to \$4.25 base and plain wire for manufacturing purposes at 3c. to 3.50c. f.o.b. mill Pittsburgh. The lower prices are those of the leading interests.

**Iron and Steel Bars.**—The situation as regards supply of steel bars is as tight as ever, the two leading local mills being out of the market as sellers for practically the remainder of this year. Other mills rolling steel bars report they are sold up for first half, and are not willing to take orders for second half until they know more as to what costs will be. Specifications against contracts are coming in very freely and some consumers who did not cover and are really in distress for steel bars are offering heavy premiums up to 4c. per lb. for fairly prompt shipment. The demand for iron bars is also very active, two of the local makers now stating they are practically sold up for first half of this year.

We quote steel bars at 2.35c. up to 3c. and 3.50c., when rolled from billets. We quote common bars at 4c. and refined iron bars 4.25c. in carloads, Pittsburgh, plus full freight to point of delivery.

**Hot-Rolled Strip Steel.**—Mills report the demand very heavy, much beyond their ability to furnish as quickly as wanted. Several makers are now quoting on the basis of prices in effect at the time shipments are made. With the constant advances in price of billets, it seems likely that still higher prices on hot-rolled strips may come in the near future. Output is being restricted on account of scarcity of steel and also of cars. We now quote hot-rolled strip steel at 5c. to 5.50c. f.o.b. mill, Pittsburgh, the lower price being regarded as minimum of the market.

**Cold-Rolled Strip Steel.**—The demand is very active; in fact, is much larger than the available supply of cold-rolled strips. Mills are sold up for some months, and report their output is being reduced on account of scarcity of steel and cars and inefficiency of labor. We continue to quote cold-rolled strip steel at 7c. to 9c. per lb. f.o.b. mill, prices depending entirely on the order and delivery wanted.

**Cold-Rolled Steel Bars.**—The demand continues very heavy, local makers being out of the market, having nothing more to sell for delivery in first half of this year, and are unwilling to sell for second half, owing to likely higher costs before that period is reached. The automobile builders are buying very freely and are not getting material anything like as fast as they want it. The absolute minimum price on cold-rolled steel bars being quoted by any of the makers is 3.85c. and prices range from this figure up to 5c. at mill.

**Spikes.**—Two local makers report that owing to the heavy demand for some time for standard spikes, they



are out of the market as sellers for first half of this year. Railroads are buying actively and inquiry is heavy. Orders placed lately with local makers include 10,000 kegs, or more, for the Pennsylvania Railroad, 5000 kegs for the Pittsburgh & Lake Erie and 3000 to 4000 kegs for the Missouri Pacific. Prices are very strong and negotiations are under way now between railroads and spike mills for 75,000 kegs, or more. The demand for boat and barge spikes is also very heavy, especially from the ship builders. One local maker on account of high costs of steel, labor and for other costs, has advanced prices on standard spikes to \$3.75 base at mill.

We quote standard spikes, 9/16 x 4 1/2 in., at \$3.60 base per 100 lb. in carload lots of 200 kegs of 200 lb. each, and small spikes, 3/4 in. and 7/16 in., \$4.25; 5/16 in., \$5; boat and barge spikes, \$4.25, f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

**Nuts, Bolts and Rivets.**—The demand is very active, most makers reporting they are sold up over first half of this year and several makers are now selling nuts, bolts and rivets on the basis of prices in effect at the time shipments are made. The higher prices for steel and labor and other increasing costs may bring about another advance in prices of nuts and bolts in the near future. Most makers are now quoting rivets on the basis of \$4.50 for structural and ship rivets and \$4.60 for large boiler rivets, these prices being an advance of \$5 or more over previous prices. Discounts on nuts and bolts being quoted by the makers are given on page 575.

**Hoops and Bands.**—The demand is still very active, local mills saying they are sold up on hoops and bands over first half of this year. The Carnegie Steel Co. is still quoting 3.05c. for hoops and bands, usual extras, but other makers are quoting 3.50c. at mill and in some cases higher.

**Boiler Tubes.**—The demand for locomotive tubes is fair, but for tubes for stationary boilers is very heavy and mills are sold up for four to six months. The demand for charcoal iron tubes is also very active, one interest reporting it is out of the market for first half. Output is being restricted to some extent by scarcity of steel and also scarcity of cars, which is holding up shipments. Discounts on iron and steel tubes, given on page 575, are firmly held and in some cases premiums are being paid for fairly prompt shipments.

**Iron and Steel Pipe.**—Practically all the mills making iron and steel tubular goods are out of the market for at least first half, and two or three leading makers are practically sold up on all they can make over the remainder of this year. Four of the larger mills are not quoting on any new inquiries, but at the same time are reserving some tonnage for regular customers to be given them from time to time, as rolling schedules will permit. Heavy premiums continue to be offered for oil well tubular goods for reasonably prompt delivery, and sales of casing and other oil well supplies have been made for delivery in the McKeesport, Pa., gas fields at abnormally high prices. Output of pipe is being cut down to some extent by shortage of steel and scarcity of cars. Heavy stocks are piled in all the mill warehouses, awaiting cars for shipment. Discounts on iron and steel pipe quoted by the leading mills are given on page 575.

**Coke.**—Coke producers report that the supply is no better, and if there is any change at all it is for the worse. On Monday, that day being usually the best day in the week, the average car supply was not above 40 per cent., and it is very doubtful if even this low average will be maintained the rest of the week. Output of furnace and foundry coke in the upper and lower Connellsville regions last week was 239,940 tons, a decrease from the previous week of about 2000 tons. Output of this week will likely be less. Government prices are still in effect, these being \$6 for spot or future furnace coke, and \$7 for spot or future foundry coke in net tons at oven.

**Iron and Steel Scrap.**—The local market on old material has quieted down in demand to some extent, and while prices are firm, the general belief is that for the time being, at least, the crest in prices has

probably been reached. Local consumers, aside from one interest, are not actively in the market as buyers, but dealers are still very firm in their ideas as to prices, and so far have shown no inclination to shade prices in order to effect sales. Deliveries of scrap by the railroads are very bad, some material being on the road for as long as six weeks, that should not have taken over one week for delivery.

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered .....	\$28.00 to \$29.00
No. 1 cast for steel plants .....	34.00 to 35.00
Re-rolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh .....	34.00 to 35.00
Compressed steel .....	24.00 to 25.00
Bundled sheet s'ides and ends, f.o.b. consumers' mills, Pittsburgh district .....	19.00 to 20.00
Bundled steel stamping .....	18.00 to 19.00
No. 1 busheling .....	24.00 to 25.00
Railroad grate bars .....	24.00 to 25.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) 1/4 in. and heavier .....	32.00 to 33.00
Railroad malleable .....	26.00 to 27.00
Iron car axles .....	34.00 to 35.00
Locomotive axles, steel .....	33.00 to 34.00
Steel car axles .....	31.00 to 32.00
Cast iron wheels .....	33.00 to 34.00
Rolled steel wheels .....	27.00 to 28.00
Machine-shop turnings .....	18.00 to 18.50
Sheet bar crop ends (at origin) .....	30.00 to 30.50
Heavy steel axle turnings .....	20.00 to 21.00
Heavy breakable cast .....	25.00 to 26.00
Cast iron borings .....	20.50 to 21.00
No. 1 railroad wrought .....	28.00 to 29.00

### World's Shipbuilding Output

According to the annual returns of the world's shipbuilding, summarized by British Lloyd's, there were launched in 1919 vessels, of over 100 gross tons, aggregating 7,144,549 tons which is more than double the world's output for any year before the war. Of this total the United States is credited with 4,075,385 tons. In 1918 the world's total was 5,447,444 tons, representing 1866 vessels. It is interesting to note that the 1919 total of over 7,000,000 tons is practically two-thirds of the total for the two four-year periods of 1911 to 1914 and 1915 to 1918 inclusive, when the total tonnage launched was 11,737,544 tons and 11,274,948 tons respectively.

The Automotive Products Corporation of New York, subsidiary of the American Steel Export Co., Woolworth Building, New York, has taken over for domestic territories embracing lower New York, New Jersey, Delaware, Maryland, eastern Pennsylvania, Virginia and West Virginia and parts of Connecticut the sale of the Beeman one-horse garden tractor. Some time ago the company took over the export sales of the machine. The tractor weighs 550 lb., is 86 in. long over all and 17 1/4 in. wide.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Hotel Chatham, that city, on Monday evening, Feb. 16. Professor Louis E. Endsley, who occupies the chair of railway mechanical engineering, University of Pittsburgh, was the principal speaker and his subject was "The Foundry from an Engineering Standpoint." Montford Jones, professor of economics in the University of Pittsburgh, was also present and made an address on "The Present Foreign Exchange Situation."

Automatic control of electrically operated blooming mills is the subject of a paper to be presented before the Cleveland section of the Association of Iron and Steel Electrical Engineers on Saturday, Feb. 28, at the Union Electric League rooms, Hotel Statler, Cleveland, by E. S. Lammers, assistant electrical superintendent National Tube Co., Lorain, Ohio.

Iron and steel industries of Pennsylvania will find no tax regulations as it concerns them changed by the Constitutional Revision Committee. The question of taxation was considered by the body last week, and endorsement given to the present statutes as to taxation of iron and steel industries. The committee has now adjourned until April.

## Chicago

CHICAGO, Feb. 17.

The transportation situation is still decidedly unsatisfactory, but has not caused any further reduction in iron and steel output. Because of this factor and a shortage of unskilled labor, the output of the two leading local mills is probably not much better than 70 or 75 per cent of normal, if that good. The imperative necessity of rehabilitation of the railroads has brought these interests to the view that purchases by the carriers should be taken care of even to the extent of giving their requirements preference over the orders of other buyers. The crippled condition of the railroads is evidenced not only by a shortage of cars but the decrepit condition of the equipment which is available for shipment. A large local interest recently received 75 cars of fuel and was able to use only 25 for shipments, the others being unfit for further service.

With exception of a railroad purchase of 3000 tons of plates and shapes for car repair work, there have been few sizable tonnages of finished steel placed in this district. The mills are simply unable to honor new inquiries except when they represent the emergency needs of the carriers, the satisfaction of the requirements of the latter being, of course, as important to other consumers of iron and steel products as to the mills themselves. Small mills located in other districts continue to sell small lots here at big premiums over the March 21 prices. These sales are merely a drop in the bucket compared with the aggregate of inquiries, but by their terms serve to emphasize the yawning gap between supply and demand.

Cast iron pipe has advanced again, this time \$3 a ton, and is moving in large tonnages. Akron, Ohio, recently purchased 2300 tons and Chicago is taking bids this week on 15,000 tons. With the appearance of large inquiries from foundries serving the railroads, pig iron has become even more buoyant than heretofore. One melter of this class has bought 15,000 tons of malleable for last half shipment and another is in the market for from 20,000 to 25,000 tons of basic for that delivery. An automobile manufacturer has purchased 30,000 to 40,000 tons of foundry for March to December shipment, part of it at as high as \$42, base Birmingham. The prospect of heavy railroad purchases of equipment, together with expected increases in freight rates and apprehension as to the extent of iron production during the remainder of the year, has given the market a strong aspect.

Scrap alone is showing weakness, not yet having recovered from the bearish effects of the decline in stocks and the threatened railroad strike.

**Pig Iron.**—Heavy buying is in progress and the already strong demand has been accentuated by generous inquiry from melters specializing on railroad work. A foundry serving the carriers has bought 12,000 tons of malleable for last half shipment and another industry in the same field is in the market for 20,000 to 25,000 tons of basic for second half delivery. Farm implement manufacturers are also making large purchases. A plowmaker is inquiring for 6000 to 8000 tons of foundry and malleable for last half shipment and another agricultural implement plant has purchased 6000 tons of foundry for the same delivery. A Wisconsin interest specializing in power machinery is asking for 5000 tons of foundry. The automotive industry is also active, a leading Michigan automobile manufacturer having bought 30,000 to 40,000 tons of foundry for March to December shipment, part of which brought as high as \$42 base, Birmingham. There is no gainsaying that the market has a bullish complexion both because of expected increases in freight rates and uncertain furnace production. Ovens in this section have been forced to use a dangerously large proportion of Illinois and Indiana coal with their Eastern coal in coke production. This is attributable to unsatisfactory shipments of fuel from the East. It is now regarded as doubtful whether this expedient will prevent the banking or blowing out of stacks, as there seems to be no prospect of any improvement in the car situation. Those cars which are

moving are in many cases so decrepit that they cannot be utilized again after they are unloaded. One local interest recently received 75 cars of coal and was able to use only 25 for out shipments, the others being unfit for further service. Inquiries from the iron consumers in this district have been so pressing that the foremost producer has been forced to book a larger tonnage for last half than it wished to in view of the uncertain outlook as to production. Such further orders as are taken will be apportioned among its customers according to the pressing character of their needs. Southern producers are also taking considerable business in this territory, the two leading makers still selling at \$40 base, Birmingham, for foundry delivery during first half and the entire remainder of the year respectively. A third Southern source of supply has opened its books for last half at the same price. Copper free low phosphorus was recently sold in small lots in this district at \$50 Ohio furnace, early shipment being specified.

The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, average, sil.	1.50
(other grades subject to usual differentials), delivered at Chicago	.....\$57.50 to \$60.50
Northern coke No. 1, sil.	2.25 to 2.75..... 45.25
Northern coke foundry, No. 2, sil.	1.75 to 2.25..... 43.00
Northern high phos. foundry	..... 43.00
Southern coke, No. 1 foundry and No. 1 soft, sil.	2.75 to 3.25..... 48.20
Southern coke, No. 2 foundry, sil.	2.25 to 2.75..... 46.60
Southern foundry, sil.	1.75 to 2.25..... 45.00
Malleable, not over 2.25 sil.	..... 43.50
Basic	..... 42.00
Low phos. (copper free)	..... 50.00
Silvery, 7 per cent	.....\$56.40 to 56.80

**Ferroalloys.**—Ferromanganese in small lots for prompt shipment has commanded as high as \$190 to \$195 seaboard. Foreign material for last half shipment is available at about \$155 delivered, while some domestic tonnage is still to be had at \$100.

We quote 80 per cent ferromanganese at \$145 to \$160 delivered; 50 per cent ferrosilicon at \$90 delivered; spiegel-isen, 18 to 22 per cent, \$60 furnace.

**Railroad Buying.**—The Great Northern Railroad has ordered 750 ore cars from the Haskell & Barker Car Co. The Soo Line has ordered 500 box cars from the Haskell & Barker Car Co. The Grand Trunk is in the market for 3000 automobile cars and 1000 flat cars. The Chicago Great Western has practically closed for 10 locomotives and the St. Louis Southwestern is inquiring for a like number.

**Plates.**—Because of the vital importance of improved transportation, both to the mills and consumers, local producers propose to do what they can to assist in the rehabilitation of the railroads, even to the extent of giving their needs preference over the bookings of other buyers. These considerations led a local mill to accept an order for 3000 tons of plates and shapes for car repair work on the Burlington Railroad. It is probable that a similar attitude will be taken toward the requirements of car builders if the carriers place further orders for rolling stock. In general the plate situation is tenser than ever, few mills being in a position to take further business. Sales which are made involve small tonnages and high prices. A Buffalo maker has booked several small lots for second-quarter delivery at 4c. mill.

Mill quotation is 2.65c. to 4.00c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.17c. for plates out of stock.

**Bars.**—A consumer in this district recently failed in an attempt to place 500 tons of mild steel bars at 4.25c. Pittsburgh for delivery at mill's convenience. This incident is illuminating testimony to the scarcity of that commodity. In rail carbon steel bars, the situation is fast becoming equally tense. One maker has withdrawn from the market and the others have little remaining tonnage to sell. Most orders for hard steel bars have been closed on the basis of the price ruling at time of delivery, present shipments being invoiced at 3¼c. to 3½c. Sales of bar iron have been heavy, with 3½c. the ruling price. Jobbers have advanced their quotations on mild steel bars ¼c.

Mill prices are: Mild steel bars, 2.35c. to 4.25c. Pittsburgh, taking a freight of 27c. per 100 lb.; common bar iron, 3.50c. to 3.75c. Chicago; rail carbon, 3.25c. to 3.50c., mill. Jobbers quote 3.87c. for steel bars out of warehouse.



**Structural Material.**—Inquiry continues heavy and despite the scarcity of shapes and high fabricating costs, there is a great deal of new construction work in sight. The Scandinavian-American Bank Building, Tacoma, Wash., will require 4000 tons of steel and the Belden Hotel, Chicago, 3900 tons. The Northwestern Bridge & Iron Co., Milwaukee, will fabricate 1500 tons for a sheet plant, to be built by the Milwaukee Rolling Mill Co. Other awards include:

Illinois Car & Foundry Co., shop addition, Hammond, Ind., 600 tons, to Wisconsin Bridge & Iron Co.  
The Falk Co., Milwaukee, addition to pattern storage vault, 300 tons, to Worden-Allen Co.  
Bulck Motor Co., car body ovens, St. Louis works, 300 tons, to Worden-Allen Co.  
C. Reiss Coal Co., anthracite shed, Green Bay, Wis., 300 tons, to Lakeside Bridge & Steel Co.  
Newport Co., miscellaneous work, Carrollville, Wis., 200 tons, to Worden-Allen Co.  
Cleveland Cliffs Iron Co., locomotive shop and round house, Hibbing, Minn., 200 tons, to Worden-Allen Co.  
Lyon Metallico Mfg. Co., warehouse, Montgomery, Ill., 160 tons, to International Steel & Iron Co.  
Tulsa, Okla., two oil tanks for power station, 155 tons, to Chicago Bridge & Iron Co.  
Sheridan Plaza Hotel, Chicago, 153 tons, to American Bridge Co.  
Interstate Drop Forge Co., Milwaukee, forge and machine shops, 130 tons, to Northwestern Bridge & Iron Co.  
Interstate Milk Co., Sparta, Wis., 100 tons, supplementing 150 tons placed last fall, to Worden-Allen Co.

Current inquiries include:

Seng Co., factory, Chicago, 2500 tons, Davidson & Weiss, architects.  
Pacific Telephone & Telegraph Co., building, Seattle, Wash., 1500 tons.  
Holly Sugar Corporation, factory, Delta, Col., 350 tons.

Jobbers have advanced structural shapes  $\frac{1}{2}$ c. per lb.

The mill quotation is 2.45c. to 3.50c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.97c. for materials out of warehouse.

**Sheets.**—Consumers continue to offer large premiums for sheets, exporters having expressed a willingness to pay as high as 9c. for galvanized. Little business, however, is being booked by the mills. A Pennsylvania mill has taken an order here for 1000 tons of galvanized and black at prices prevailing at time of shipment, second quarter delivery being specified. The warehouse quotation on blue annealed has advanced to 5.52c.

Mill quotations are: 4.35c. to 5.35c. for No. 28 black; 3.55c. to 4.50c. for No. 10 blue annealed, and 5.75c. to 6.75c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight of 27c. per 100 lb. to Chicago. The lowest prices are those of March 21.

Jobbers quote, Chicago delivery out of stock: No. 10 blue annealed, 5.52c.; No. 28 black, 6.50c.; No. 28 galvanized, 8.00c.

**Rails and Track Supplies.**—Little business has been closed in this territory since the leading interest withdrew from the market.

We quote: Tie plates, iron, 3.75c., f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

**Cast-Iron Pipe.**—Pipe has advanced \$3 a ton. Awards are numerous and much new work is in sight. Pipe shops are so heavily booked on the small sizes that they fear they will soon be unable to take further orders for that class of pipe. Chicago will take bids on 15,000 tons of 24 to 48-in. on Feb. 19. Elmhurst, Ill., received tenders from contractors yesterday on 1279 tons. Battle Creek, Mich., took bids on its annual requirements last Saturday, and Milwaukee will receive figures on Feb. 20 on 300 tons of 6-in., 200 tons of 8-in. and 250 tons of 12-in. The United States Cast Iron Pipe & Foundry Co. has been awarded 2330 tons by Akron, Ohio; 1100 tons by Sioux City, Iowa, and 500 tons by Rockford, Ill.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$75.80; 6-in. and above, \$72.80; class A and gas pipe, \$2 extra.

**Bolts and Nuts.**—The growing disparity between supply and demand has been reflected in an advance of 10 per cent on bolts and \$10 a ton on hot-pressed nuts by those manufacturers who have not withdrawn from the market.

Jobbers quote: Structural rivets, 4.97c.; boiler rivets, 5.07c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 35 and 5 per cent off; larger sizes, 25 and 5 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 30 off; larger sizes, 20 off; hot pressed nuts, square tapped and hexagon tapped, \$1.45 off; coach or lag screws, gimlet points, square heads, 40 and 5 per cent off. Quantity extras are unchanged.

**Wire Products.**—While the transportation situation is slightly better, the mills were forced to pile considerable material during the past week or two because of the car shortage. The leading interest is still ship-

ping against old commitments and is taking no new business except small tonnages to help customers badly in need of material. The demand is unabated. For mill prices see Finished Iron and Steel, Pittsburgh, page 575.

**Old Material.**—The entire scrap list was softer last week because of the impending railroad strike and the weakness in the stock market. With the strike canceled and better feeling in Wall Street, dealers expect prices of old material to recover. The weakness in open-hearth grades was accentuated through the shutting off of shipments by a large coal consumer. Nearly all grades of scrap have declined a half dollar or more. There are no new railroad lists, the sharp reduction in offerings being attributed to the desire of the carriers to defer further sales until March, when they will get the full benefit of the profit they may make.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$33.00 to \$34.00
Relaying rails	40.00 to 50.00
Car wheels	38.00 to 39.00
Steel rails, rerolling	33.50 to 34.50
Steel rails, less than 3 ft.	29.50 to 30.00
Heavy melting steel	24.50 to 25.00
Frogs, switches and guards, cut apart	24.50 to 25.00
Shoveling steel	24.00 to 24.50
Low phos. heavy melting steel	23.00 to 29.00

Per Net Ton	
Iron angles and splice bars	\$30.00 to \$31.00
Steel angle bars	25.50 to 26.00
Iron arch bars and transoms	30.50 to 31.50
Iron car axles	39.00 to 40.00
Steel car axles	34.50 to 35.00
No. 1 busheling	20.00 to 21.00
No. 2 busheling	14.50 to 15.00
Cut forge	23.50 to 24.00
Pipes and flues	19.50 to 20.00
No. 1 railroad wrought	26.00 to 27.00
No. 2 railroad wrought	23.50 to 24.00
Steel knuckles and couplers	26.50 to 27.00
Coil springs	28.50 to 29.00
No. 1 cast	38.50 to 39.00
Boiler punchings	26.50 to 27.00
Locomotive tires, smooth	26.50 to 27.00
Machine shop turnings	13.50 to 14.00
Cast borings	14.00 to 15.00
Stove plate	31.50 to 32.00
Grate bars	31.00 to 32.00
Brake shoes	26.50 to 27.50
Railroad malleable	29.25 to 30.25
Agricultural malleable	28.75 to 29.75
Country mixed	18.00 to 19.00

## Buffalo

BUFFALO, Feb. 16.

**Pig Iron.**—Not very much iron was sold in the Buffalo district last week with three out of four furnaces sold up and one of these not even taking tonnages from old customers. One furnace sold 7000 tons of foundry iron at \$45 for No. 2 plain, 1.75-2.25 silicon; \$46.25 for No. 2 X 2.25-2.75 silicon; \$48 for No. 1 foundry, 2.75-3.25 silicon. This furnace took care of its regular trade. One of the contracts was for 1000 tons of No. 2 X. All was for second half delivery. Another furnace interest has increased the price of basic iron to \$44 and is not taking any foundry tonnages under \$45 base. This furnace is practically the only one not sold out. A lot of 2500 tons of basic was sold for \$44. This furnace could sell any tonnage it cared to, but desires to keep some capacity; so is selling very cautiously. The local furnaces of an interest which has a selling agency for other furnaces are sold up and no more iron will be taken for them, though special irons will be sold from time to time. Another interest sold a small tonnage of iron during the week at a \$45 base for foundry. The \$45 base is now ruling in all transactions which are made. The price schedule is as follows for such tonnages as are obtainable f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	\$48.00
No. 2X foundry, 2.25 to 2.75 silicon	46.25
No. 2 plain, 1.75 to 2.25 silicon	45.00
Basic	44.00
Malleable	42.25
Lake Superior Charcoal	\$58.00 to 60.00

**Finished Iron and Steel.**—A very serious transportation situation exists throughout this district. With mills all sold up and principally concerned with getting material out of their yards, few cars are available, and it is necessary for them to stack with consumers insistently calling for shipments. The demand keeps up strongly with practically no material offered. Con-

sumers are bidding for material to such an extent that prices have taken the following spread: Bars 2.35c. to 4c.; shapes, 2.45c. to 4c.; plates, 2.65c. to 4c.; cold finished steel, 3.85c. to 5c. The leading interest is holding fast to March 21 quotations, leaving the price raising to the independent mills. Consumers from as far east as Albany are trying to secure material from Chicago warehouses. No material is moving except some from the smaller mills. The John W. Cowper Construction Co. has contracted for the erection of a foundry building for the American Radiator Co., Buffalo. About 100 tons of steel will be used.

**Old Material.**—The condition of the market is very similar to last week. Conditions are quiet but there is nothing to indicate that the market is due for a severe setback. It is already beginning to appear spotty with outside mills reviving interest. It is believed that within the next week or 10 days there will be a buying movement with eastern Pennsylvania mills originating it. These mills are now actively seeking heavy melting steel and turnings. There is a real shortage and demand for small cast scrap, stove plate and car wheels. Almost any price would be paid for these grades at this time.

We quote dealers' asking prices, per gross ton f.o.b., Buffalo, as follows:

Heavy melting steel, regular grades.....	\$27.00 to \$28.00
Low phos., 0.04 and under.....	32.00 to 33.00
No. 1 railroad wrought.....	31.00 to 32.00
No. 1 machinery cast.....	38.00 to 39.00
Iron axles.....	40.00
Steel axles.....	40.00
Car wheels.....	37.00 to 38.00
Railroad malleable.....	31.00 to 32.00
Machine-shop turnings.....	17.50 to 18.00
Heavy axle turnings.....	21.00 to 22.00
Clean cast borings.....	20.00 to 21.00
Iron rail.....	30.00 to 31.00
Locomotive grate bars.....	24.00 to 25.00
Stove plate.....	30.00 to 31.00
Wrought pipe.....	20.00 to 21.00
No. 1 bushing.....	22.00 to 23.00
Bundled sheet stamping.....	19.00 to 20.00

## New York

NEW YORK, Feb. 17.

**Pig Iron.**—The past week has been, like the one preceding it, in transactions being of small volume compared with earlier weeks and in prices being maintained. The only reports of concessions were on some sales for second half, as, for example, 3000 tons of No. 2 X said to have been sold at \$43.75 eastern Pennsylvania furnace. Virginia iron is firm at the \$42 base and may soon be advanced. Buffalo iron is selling in limited quantities at \$45, base. Considerable tonnage of off iron is being disposed of at the usual price concessions. Weather conditions in New York State and New England continue to interfere with deliveries of iron.

We quote for delivery in New York, last half of the year, as follows:

No. 1 foundry, sil. 2.75 to 3.25.....	\$47.05 to \$48.05
No. 2 X, sil. 2.25 to 2.75.....	46.05 to 47.05
No. 2 plain, sil. 1.75 to 2.25.....	44.80 to 45.80
No. 2 X, Virginia, sil. 2.25 to 2.75.....	46.40

**Ferroalloys.**—An indication of the present scarcity of ferromanganese is the sale of several carload lots at \$180 for delivery in the next 60 days. Inquiry, particularly for spot and early delivery, is fairly active but the alloy to meet this demand seems exceedingly scarce. Not much British alloy is available before the second half, and prices for such as is obtainable at all range from \$155, seaboard, up. There have been sales of quantities up to several hundred tons for delivery in the second quarter and later at \$150 to \$155, seaboard. American producers are asking \$160, delivered, for second half, at which level some business is reported. Demand for this position, however, is not heavy. Spiegeleisen is quiet and stronger, the minimum price being \$57, furnace, quotations ranging from \$57 to \$60. Sales aggregating 500 tons have been made for delivery ranging from the second quarter on. Foreign demand, while not as heavy as in the past, is still an important factor. Ferrosilicon, 50 per cent, is quiet but strong at \$80 to \$90 per ton, delivered.

**Finished Iron and Steel.**—Prospective railroad demands for steel and for equipment which requires steel

in its manufacture are looming up, and will further complicate the congested condition of order books, providing the steel companies are able to take the business at all. There are numerous inquiries in the market for locomotives and cars, and while financial arrangements to make purchases possible are still lacking, it is regarded as certain that some means will be found, particularly in the case of the trunk line roads, to provide the necessary rolling stock and repair material. Among current inquiries are quite a number for passenger cars, the New York Central asking for bids on 200, the Missouri, Kansas & Texas on 50 or more and the Missouri Pacific on 25. The Delaware, Lackawanna & Western Railroad is reported to have purchased some from the Pullman Co. The Great Northern Railroad will probably close this week for 1000 ore cars. In addition to the needs of domestic roads, foreign business in locomotives is active, the American Locomotive Co. having taken orders for a total of 35, of which 20 Mikado type are for the Tientsin Pukow of China and 15 Pacific type are for the Madrid, Zaragossa & Alicante Railway of Spain. Domestic orders taken by the American Locomotive Co. include the following: 12 for the Florida East Coast Railroad; six for the Delaware, Lackawanna & Western and four for the Toledo Terminal Railroad. The order of the Florida East Coast Railroad was reported from Chicago last week. Some large projects are now being figured on in the structural steel market. An office building to be erected at Forty-second Street and Madison Avenue, New York, will require 5000 tons. The H. W. Johns-Manville Co., New York, will require 4000 tons for plant additions. The American Bridge Co. has taken 3000 tons and the McClintic-Marshall Co. 3500 tons for the new tire plant of the Dunlop-American Co., Ltd., to be built at Buffalo. The Lackawanna Bridge Co. has taken 1000 tons for the Vermont Marble Co., Proctor, Vt., and the United Lead Co., Elkhart, Ind., has let 600 tons for a plant addition. There are calls for universal plates for some large structural jobs which have been let in recent weeks, one such inquiry being for 1500 tons. A large ship repair interest, with several yards, is in the market for 25,000 tons of hull steel, including plates, shapes and sections, and 12,000 tons of boiler steel and is asking for best possible delivery. The situation as to prices and delivery is virtually unchanged, except that one Eastern mill has found a place in its schedule for about 5000 tons of plates for early delivery, but will accept orders only for tank steel. It took one order for 600 tons at 4c., Pittsburgh, with delivery in 30 days. As showing the variation in prices, a large consumer has bought upwards of 5000 tons of plates for fairly early delivery at 3.25c. and 3.50c., Pittsburgh. Most plate mills are unable to make early delivery, but some second quarter tonnage will be available as soon as production improves sufficiently to justify further bookings. Small lots of bars have sold at from 4c. to 4.25c., Pittsburgh, and one or two Eastern mills rolling shapes have come into the market to a small degree and have taken shapes at around 4c., Pittsburgh. Open hearth re-rolling billets are said to be unobtainable for early delivery below \$60, Pittsburgh, while \$70 to \$75 would be asked for forging quality. While no definite statement has been made by the United States Steel Corporation as to whether its recent advances in wages to labor will be followed by increased prices of steel products, the impression has rapidly gained ground among consumers and independent sellers that the leading interests will take such action. In fact, one large consumer is figuring all of its work on the basis of higher steel costs.

We quote for mill shipment, New York, as follows: Soft steel bars, 2.62c. to 4.52c.; shapes, 2.72c. to 4.02c.; plates, 2.92c. to 4.27c., the minimum prices being for indefinite delivery and the higher prices for the first, even the second quarter; bar iron, flats, wider than 6 in., 4.07c.;  $\frac{3}{4}$  and  $\frac{7}{16}$  in., round and square, 4.47c.; light rounds, squares and flats, 4.77c., and other sizes, 3.77c.

**Warehouse Business.**—The jobbing trade has been at a standstill the past week. Impassable icebound streets practically put a complete stop to both horse and motor truck delivery by last Saturday, when warehouse vehicles, many badly damaged, were generally



withdrawn from service. Temporary embargoes at rail terminals and coastline piers are now off, but trucking remains tedious and hazardous. Incoming car shipments are scattering, and stocks are virtually wiped out in many sizes and materials. While jobbers are anxious to place orders, the mills will not take any more for first or second quarter and have not yet opened their books for deliveries after July 1. One prominent dealer in sheets has on hand considerably less than 25 per cent of normal stocks, and this in only a few gages. Manufacturers are combing the warehouses for materials, and some jobbers are being swamped with inquiry. One leading jobbing house has declined to take any more orders subsequent to last Saturday's bookings. While forehanded manufacturers may probably be credited with sufficient supplies, the premiums being paid for warehoused materials are generally considered evidence that many factories are worse off than at any time during the war. The last independent warehouse interest adhering to the Corporation jobbing scale has raised its prices, effective Feb. 16, as follows: Soft steel, \$9 per ton; shapes, angles, tank plates and blue annealed sheets, \$10; hoops and bands, \$12. Cold-drawn steel at 6c. and 6.50c. base is being sold in some cases for 9c. and 10c., with sizes 1 in. and smaller bringing whatever the seller asks. The leading interest in this line is reported bare of all sizes under 1½ in. We quote out-of-store prices as follows: Steel bars, 3.52c. to 4.25c.; structural shapes, 3.47c. to 4.25c.; plates, 3.67c. to 4.50c.; No. 10 blue annealed sheets, 5.07c. to 6.25c.; 28-gage black sheets, 7c. to 9c.; 28-gage galvanized, 8.25c. to 10c.; shafting and screw stock, nominal.

**Cast-Iron Pipe.**—All manufacturers are filled up with orders for practically four months. There is a particular scarcity of sizes under 16-in. and in fact stocks in all yards are close to nil. All bids on the 22,000 tons of pipe for South America were rejected and because of the higher prices recently prevailing, it is believed that this inquiry will remain unsold, as well as that for the large tonnage of 20-in. pipe asked for Cuba some time ago. Pipe makers are confident they could sell much pipe to European countries were it not for the low exchange. Because of the high cost of cast scrap, some makers are buying off pig iron as a substitute. We quote 6-in. and heavier at \$70.30, New York; 4-in., \$73.30, with \$2 additional for Class A and gas pipe.

**Old Material.**—The market is softer in steel, but stronger in cast, stove plate and grate bars. Shipments of steel to the Pittsburgh district have fallen off, brokers attributing the slackening of demand to inability of steel users to get fuel. The better grades of steel were going to this district; the less desirable grades are going in usual volume to eastern Pennsylvania. The local market for stove plate was boosted when a Mahwah, N. J., consumer offered \$32, delivered, for this grade. A Brooklyn dealer claims to be paying 2c. per lb. for cast scrap. Many foundries, unable to procure pig iron on their contracts, are sending rush orders for cast to be delivered by truck, this tending to raise the market.

Buying prices per gross ton, New York, follow:

Heavy melting steel.....	\$21.50 to \$22.00
Rerolling rails.....	31.00 to 32.00
Relaying rails, nominal.....	47.00 to 48.00
Steel car axles.....	34.00 to 35.00
Iron car axles.....	43.50 to 44.00
No. 1 railroad wrought.....	33.00 to 34.00
Wrought iron track.....	25.00 to 25.50
Forge fire.....	18.00 to 18.50
No. 1 yard wrought, long.....	26.00 to 26.50
Light iron.....	10.00 to 11.00
Cast borings (clean).....	20.00 to 20.50
Machine-shop turnings.....	17.00 to 17.50
Mixed borings and turnings.....	16.00 to 16.50
Iron and steel pipe (1 in. min. diam., not under 2 ft. long).....	21.50 to 22.00
Stove plate.....	28.50 to 29.50
Locomotive grate bars.....	28.50 to 29.50
Malleable cast (railroad).....	29.00 to 30.00
Old car wheels.....	39.00 to 40.00
Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton:	
No. 1 machinery cast.....	\$41.00 to \$42.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	38.00 to 39.00
No. 1 heavy cast, not cupola size.....	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.).....	29.00 to 30.00

## Boston

BOSTON, Feb. 17.

**Pig Iron.**—Because of the activity of one Virginia furnace representative, who sold in excess of 10,000 tons, including 1200 tons No. 2 X last half to a Massachusetts textile concern, local pig iron bookings for the week exceeded those for the previous week, being in the neighborhood of 18,000 tons. The Virginia furnace in question sold 1.75 to 2.25 and 2.25 to 2.75 with a little No. 1 X, mostly for first half delivery at \$42 furnace base, or \$46.70 for No. 2 plain and \$47.95 for No. 2 X delivered. This furnace is the only Virginia one offering first half iron. Machine tool interests figured conspicuously in the buying. The leading Virginia company and Pulaski are out of the market. Susquehanna has withdrawn from the market for the time being, at least, after having taken further limited orders on a \$45 furnace base. Other Buffalo interests are reported selling for less than \$45, but sales cannot be verified. Two Pennsylvania furnaces have sold second half iron on a \$44 base, and another at \$43 for second quarter and last half. The Thomas Iron Co. remains out of the market, notwithstanding bids at \$45 and \$46 base. A small tonnage of Sloss Sheffield silicon, 2.25 to 2.75, second and third quarter iron, was bought by a local consumer at \$41.60 furnace. A few cars of resale eastern Pennsylvania iron brought \$50 furnace, and two cars \$53, plus loading charges and extra freight, making the delivered cost about \$58. A little charcoal prompt and balance of first half delivery sold at \$62.25. One furnace is quoting \$71.75 for third quarter iron. Pittsburgh has bought 800 tons and New England interests 100 tons of Richmond, Mass., charcoal at \$65 furnace. A small amount of malleable first half sold at \$45.50 furnace, an advance of \$1. Several hundred tons Bessemer 1 to 2 per cent sold through a local house to a New Jersey consumer at \$39 Buffalo furnace. Delivered prices follow:

Eastern Pennsylvania silicon, 2.25 to 2.75.....	\$47.15 to \$48.15
Eastern Pennsylvania silicon, 1.75 to 2.25.....	45.90 to 46.90
Buffalo silicon, 2.25 to 2.75.....	50.15
Buffalo silicon, 1.75 to 2.25.....	48.90
Virginia silicon, 2.25 to 2.75.....	47.95
Virginia silicon, 1.75 to 2.25.....	46.70
*Alabama silicon, 2.25 to 2.75.....	47.35
*Alabama silicon, 1.75 to 2.25.....	45.75

\*Alongside Boston prices.

**Coke.**—Both the New England Coal & Coke Co. and the Providence Gas Co. came into the market with second half coke on a \$11.90 delivered base, but after two or three days withdrew. The New England company will accept spot business at \$9.50 where the freight is less than \$2.40, and at \$10 where it is more. Between Feb. 1 and Feb. 14, the Providence Gas Co. could not get a car from the New Haven. No Connellsville coke is offered here.

**Finished Iron and Steel.**—Confiscation of coal by the railroads, which crippled mills, and a tieup of transportation by storms in the North, practically eliminated the movement of finished iron and steel into New England during the past week. New business also has been abnormally small, local mill representatives being instructed to cut bookings to a minimum. The Maine Central Railroad has covered its 1920 rail requirements, taking 6000 tons from the Lackawanna Steel Co. Steel bars, generally speaking, are quoted at 3c., f.o.b. Pittsburgh, and iron 4c., but liberal premiums are offered for the former, which are scarce here. Five cents is offered for small tonnages of plates, prompt delivery. This price is exceptional, the average market range being 3.50c. to 4.25c. Only a limited tonnage of heavy plates is available. The Chicago Bridge & Iron Co. was awarded 600 tons for three 5500-bbl. tanks, Hartford Electric Light Co., Hartford, Conn., fabrication in February, 1921. The Atlantic Works is figuring on three large Government marine boilers. The Bath Iron Works is covered on its three marine boilers. Structural prices range from 2.70c. to 4c., f.o.b. Pittsburgh, the top price for nearby delivery. The Jencks Tire Fabric Co., Drummonville, Que., plant, 900 tons structural, figured by local interests, went to

Canadian fabricators. The Lackawanna Bridge Co., Buffalo, is awarded 900 tons, Vermont Marble Co., West Rutland. Sizable tonnages of steel sheet piling at 3c., f.o.b. Pittsburgh, have been booked here.

**Warehouse Business.**—Local warehouse prices on soft steel bars, steel flats, concrete bars, structural, tire steel, open-hearth and crucible spring steel have been advanced \$5 a ton; those on refined iron round and squares and on best iron are \$10 a ton higher, and those on steel and iron bands and hoops, \$11. No change is made in cold-rolled steel quotations. Soft steel bars and common refined iron are selling on the same basis for the first time in months. Local supplies of steel have almost vanished and the advance in prices is largely for the purpose of encouraging substitution of iron. Blue annealed and black sheets have been marked up \$10, and galvanized sheets \$20 a ton. Plate prices are unchanged. One tire bolt manufacturer has advanced prices, but local warehouses have not changed their lists. The wire nail situation is a little easier, the American Steel & Wire Co. making slightly larger shipments to Boston jobbers. Under the most favorable conditions, however, it will be many months before back orders in jobbing hands are filled. Revised warehouse prices on iron and steel follow:

Jobbers quote: Steel bars, cold rolled rounds, \$6 per 100 lb. base; squares, hexagons, flats, \$6.50 base; soft steel, flats, rounds, squares, \$4.50 base; concrete bars, plain round, square, \$4.50; twisted squares, \$5; structural steel under 3 in., \$4.50; structural, 3 in. and over, \$4.25; tire steel, \$5.20; spring steel open-hearth, \$9; special, \$13; toe calk steel, \$6.25; steel hoops, \$7; steel bands, \$6; iron, refined, except as follows, \$4.50 base; 1/2-in., 9/16-in. round, square and 2 3/4-in. round, square and larger, \$4.90 base; 7/16-in. round, square and smaller, \$6.50 base; over 6 in. wide, \$6 base; best refined iron, \$6 base; Wayne iron, \$7 base; band iron, \$6; hoop iron, \$7; Norway iron, \$20; No. 10 blue annealed sheets, \$6.05 base; No. 28 black sheets, \$8.15; No. 28 galvanized sheets, \$9.50; plates, \$4.80 base.

**Old Material.**—Car lots of scrap have been moved from Worcester, Portland and elsewhere, but shipments in and out of New England have been at a minimum since last reports. No. 1 heavy melting steel is \$1 lower and not moving. Buying of railroad wrought by Rockaway, N. J., Albany, N. Y., and New York State horseshoe interests early in the week caused an upturn in the market, \$32 being paid here. Considerable street railway wrought is offered, but it does not grade up well. Local dealers feel that yard wrought should bring more than quoted, but report almost no demand. Steel plant buying of machine-shop turnings has firmed the market and blast furnaces are offering \$20 delivered for that grade. Rolling mills have bought cast iron borings. Heavy axle turnings are easier. One sale of strictly No. 1 machinery cast is reported at \$38.50 f.o.b. Boston, but the market is quiet to-day and at least 50c. lower. The edge is off the stove plate market, prices being a shade easier. Car wheels are scarce, in demand and higher. Yard quotations on old material follow:

No. 1 heavy melting steel.....	\$21.00 to \$22.00
No. 1 railroad wrought.....	30.00 to 31.00
No. 1 yard wrought.....	24.00 to 25.00
Wrought pipe (1 in. in diameter, over 2 ft. long).....	20.50 to 21.50
Machine-shop turnings.....	16.25 to 17.25
Cast iron borings.....	19.50 to 20.50
Heavy axle turnings.....	18.00 to 19.00
Blast furnace borings and turnings.....	14.50 to 15.50
Forged scrap.....	16.50 to 17.50
Bundled skeleton.....	16.50 to 17.50
Steel car axles.....	31.00 to 32.00
Car wheels.....	38.00 to 39.00
Machinery cast.....	37.00 to 38.00
No. 2 cast.....	35.00 to 36.00
Stove plate.....	26.00 to 27.00
Railroad malleable.....	28.00 to 29.00
Rerolling rails.....	29.00 to 30.00

## Cincinnati

CINCINNATI, Feb. 17.

**Pig Iron.**—The local pig iron market has been quiet the past week and sales have not aggregated anywhere near the tonnage disposed of during the past three weeks. Inquiry is picking up again, however, much of it coming from other districts. Local consumers are apparently waiting to see what happens in the near future before coming into the market for their last half requirements. Some sales of Virginia and Alabama iron have been made in this territory for first half shipment, but most of the iron disposed of has been for points in northern Michigan and Illinois. On foundry grades prices are holding very firm at last

week's levels, and Ohio silvery has been advanced during the week, so that now \$55, furnace, for 8 per cent silicon is the minimum at which this iron can be had. One silvery furnace is quoting \$57.50. In southern Ohio, furnaces are reported absolutely sold up for first half. One interest there is reported not to have sold a ton of iron for second half delivery, but others are reported to have sold from 50 to 70 per cent of their output. Some furnaces willing to book business for second half are quoting \$45, Ironton, for silicon 1.75 to 2.25, and a few sales of small lots have been made at this figure. Virginia iron is being sold on a basis of \$42, furnace. At least two large producers of Southern iron are still quoting over the rest of the year at \$40, Birmingham, for the base grade. Sales are also being made at \$42, Birmingham, for prompt delivery, and one interest disposed of an aggregate of about 2000 tons at this figure. A Southern interest which has been out of the market for some time took on some business for one of its regular customers at \$40, furnace. We note sales of 3000 tons of Bessemer for delivery outside this territory at \$45, furnace, 1200 tons Southern foundry silicon 2.75 to 3.25 silicon, to a Kentucky melter one 1200-ton lot and one 900-ton lot of Southern foundry, silicon 2.25 to 2.75, at the \$40 base price for second half. We also note a sale of 500 tons of Southern basic in this territory at \$40, furnace. Inquiry before the market includes 2100 tons for a Michigan melter and 2000 tons for Illinois. No sales of basic or malleable are reported and quotations given are nominal. Jisco silvery furnace was forced out of blast last week by the falling in of the lining, and will be down at least six weeks for repairs.

Based on freight rates of \$3.60 from Birmingham and \$1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base price).....	\$43.60 to \$45.60
Southern coke, sil. 2.25 to 2.75 (No. 2 soft).....	44.85 to 46.85
Ohio silvery, 8 per cent sil.....	56.80
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2).....	43.80 to 45.80
Basic, Northern.....	40.40
Malleable.....	43.80 to 45.80

**Coke.**—The coke situation shows slight improvement, and furnaces in southern Ohio have been able to accumulate enough to keep them running continuously. Conditions are also showing some improvement at sheet mills and a local jobber reports that he was able to get orders on the books of one concern for 60 to 90 days delivery. However, mills, generally speaking, are not inclined to take new business until some of that now on the books has been shipped out. Embargoes have been placed on almost all classes of freight from this city to points East and North. The local terminals are clear, however, and able to handle all freight coming in.

**Old Material.**—The scrap market has developed weakness, though prices remain at last week's levels. Local foundries are not purchasing to any extent, and freight embargoes against Eastern cities prevent dealers from shipping into those points. The salvage board announces a sale by negotiation of about 1600 tons of steel scrap located at the Mosler Safe Co., Hamilton, Ohio.

Per Gross Ton	
Bundled sheet.....	\$16.00 to \$17.00
Old iron rails.....	27.00 to 28.00
Relaying rails, 50 lb. and up.....	44.00 to 45.00
Rerolling steel rails.....	30.00 to 31.00
Heavy melting steel.....	22.00 to 23.00
Steel rails for melting.....	24.00 to 25.00
Car wheels.....	29.00 to 30.00
No. 1 railroad wrought.....	26.00 to 27.00
Per Net Ton	
Cast borings.....	\$13.50 to \$14.00
Steel turnings.....	12.00 to 12.50
Railroad cast.....	30.00 to 31.00
No. 1 machinery.....	33.00 to 34.00
Burnt scrap.....	20.00 to 21.00
Iron axles.....	29.50 to 30.00
Locomotive tires (smooth inside).....	23.50 to 24.50
Pipes and flues.....	17.00 to 17.50
Malleable cast.....	23.00 to 23.50
Railroad tank and sheet.....	16.00 to 16.50

At Washington recently the House claims committee approved an award of \$714,000 to the McClintic Marshall Co., Pittsburgh, for extra work on the locks of the Panama canal, which was not covered by its contract.



## St. Louis

ST. LOUIS, Feb. 16.

**Pig Iron.**—Renewal of buying the past week has seemed to indicate that the melters are using up their pig iron rapidly as they have been in the market for both prompt and future delivery into the last quarter. The sales have ranged generally from 1,500 tons downward for all deliveries and there has been little or no question as to price, the consumers being willing apparently to pay whatever price was asked. Figures have been marked up during the week by furnaces represented here with Birmingham basis No. 2 Southern showing a spread between furnaces from \$42 to \$44 per ton. Ohio iron is quoted at \$46.25 Ironton, and the local producer is putting the price at \$46 while the Chicago furnaces are apparently out of the local market, being more than sold up as a result of reduced production due to the strike. No Lake Superior charcoal iron is available in this market.

**Coke.**—No coke is being sold in this market from the Virginia, West Virginia or Connellsville ovens, due to the inability to get cars for transportation either of the coke or the coal from which to make it, while by-product coke, sold up as the ovens are in this district, is moving only under existing contracts.

**Finished Iron and Steel.**—In finished products, inability to make deliveries is the controlling fact and no new business is being sought or taken, although the filing of specifications under existing contracts continues. A higher tendency is noted in warehouse lines and some of the items are marked up, while deliveries are growing steadily worse. For stock out of warehouse we quote as follows:

For stock out of warehouse we quote as follows: Soft steel bars, 3.94c.; iron bars, 4.59c.; structural material, 4.04c.; tank plates, 4.24c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.60c.; No. 28 galvanized black sheet gage, 8.10c.

**Old Material.**—Business has been light during the past week so far as local consumers are concerned, the disposition being to await further developments, although one big mill is expected to resume buying shortly because of needs developing. The larger dealers have been buying from the smaller concerns on the recent decline and shipping East and North on contracts on which the present prices netted them a profit. No railroad lists came out during the week.

We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails.....	\$31.50 to \$32.00
Old steel rails, rerolling.....	32.50 to 33.00
Old steel rails, less than 3 ft.....	30.00 to 30.50
Relaying rails, standard sections, subject to inspection.....	45.00 to 50.00
Old car wheels.....	33.50 to 34.00
No. 1 railroad heavy melting steel..	25.00 to 25.50
Heavy shoveling steel.....	22.50 to 23.00
Ordinary shoveling steel.....	22.00 to 22.50
Frogs, switches and guards, cut apart	26.00 to 26.50
Ordinary bundled sheets.....	16.00 to 16.50
Per Net Ton	
Heavy axle and tire turnings.....	19.00 to 19.50
Iron angle bars.....	28.00 to 28.50
Steel angle bars.....	23.00 to 23.50
Iron car axles.....	37.00 to 37.50
Steel car axles.....	35.00 to 35.50
Wrought arch bars and transoms....	32.50 to 33.00
No. 1 railroad wrought.....	25.50 to 26.00
No. 2 railroad wrought.....	23.50 to 24.00
Railroad springs.....	23.00 to 23.50
Steel couplers and knuckles.....	24.00 to 24.50
Locomotive tires, 42 in. and over smooth inside.....	25.00 to 25.50
No. 1 dealers' forge.....	23.00 to 23.50
Cast iron borings.....	15.00 to 15.50
No. 1 busheling.....	23.00 to 23.50
No. 1 boiler, cut to sheets and rings..	18.50 to 19.00
No. 1 railroad cast.....	35.50 to 36.00
Stove plate and light cast.....	30.50 to 31.00
Railroad malleable.....	26.50 to 27.00
Agricultural malleable.....	26.00 to 26.50
Pipes and flues.....	20.50 to 21.00
Heavy railroad sheet and tank.....	20.00 to 20.50
Railroad grate bars.....	29.50 to 30.00
Machine-shop turnings.....	15.50 to 16.00
Country mixed.....	22.50 to 23.00
Uncut railroad mixed.....	23.50 to 24.00
Horseshoes.....	24.00 to 24.50

A brochure, entitled "Financial Status of Belligerents," by Louis Ross Gottlieb, has been published by the Bankers' Trust Co., New York. It gives the debt, revenue and expenditures, and the note circulation of the principal belligerents in the world war.

## Cleveland

CLEVELAND, Feb. 17.

**Iron Ore.**—The ore market has quieted down, following a very active buying movement that lasted for two weeks. While total sales have been large, they have not been up to expectations of some of the sellers. Although the bulk of the buying has been done, there is still a fair amount of business to be placed, some of which is now pending. With the \$1 a ton advance in ore prices comes an advance of 10 per cent in the wages of miners, announcement of which was made Monday. This advance had been expected because of the recently announced wage advance of the United States Steel Corporation and will apply to employees of all independent mining companies, as well as to those of the Oliver Mining Co., which operates the mines of the Steel Corporation. The advance will be effective from Feb. 1. Ore consumers, both steel plants and merchant furnaces, in the Pittsburgh district, including Wheeling, and the Valley and Chicago districts, have not purchased as much ore as had been expected. This is probably due to surplus stocks resulting from curtailed operations during the steel strike, to uncertainty about future operations because of the coke situation and to an attitude of conservative buying because of the advance in price. The buying in the East has been proportionately heavier than in the Central West. Possibly one reason for this is that Eastern furnaces were not so much affected by the steel strike as those in the Central West. The foreign ore situation also doubtless has had something to do with the heavy purchasing of Lake ore by Eastern consumers. Last year Eastern furnaces expected lower rates and a surplus of vessels for moving ore this year, but the vessel situation is apparently about as acute as ever and rates are about the same as a year ago. Sales of Lake Superior ore to Eastern furnaces so far aggregate about 2,000,000 tons, approximately 1,500,000 tons of which was taken by one interest. There is also a good demand for Lake Superior ore from Virginia furnaces and orders already placed and those pending aggregate about 500,000 tons. With low-priced pig iron Virginia furnaces cannot afford to buy Lake Superior ores, but use the low-priced local ores. However, with the present high price of pig iron they will use a great deal of lake ore. Ore sales in the southern Ohio territory have been fairly good. Several of the ore sellers are entirely sold up on some of their high-grade ores. There has been fair demand during the past few days for Bessemer ore, which was not active during the early part of the buying movement.

We quote, delivered, lower Lake ports: Old range Bessemer, \$7.45; old range non-Bessemer, \$6.70; Mesaba Bessemer, \$7.20; Mesaba non-Bessemer, \$6.55.

**Pig Iron.**—Sales have fallen off considerably, owing to the fact that several makers are virtually out of the market, but inquiry is still heavy. Two or three of the leading producers are sold up to 75 or 80 per cent of capacity for the last half, and have practically no iron left for earlier delivery. One interest sold 43,000 tons during February and another took orders during the week for 12,000 tons of foundry and malleable iron, including four lots of 1000 tons each. Prices are \$2 per ton higher on foundry grades. A week ago foundry iron was still being quoted at \$40 for 1.75 to 2.25 silicon, although a few sales had been made at \$42. At present, however, the market is established at \$42, most of the sales during the past few days having been made at that price. Small lots of foundry iron for early shipment have been made at \$45, and that price is being quoted by a southern Ohio furnace for the last half. While considerable basic iron has brought \$43 for the first half, some producers are not asking that price for the last half. On an inquiry for 12,000 to 15,000 tons for the Sharon plant of the American Steel Foundries, a Cleveland furnace quoted \$40 and the iron is understood to have been bought at that price from a furnace with a low freight rate. The General Electric Co. has inquired for 10,400 tons of iron for its Erie works. Of this 1000 tons is malleable iron, 2400 tons high silicon foundry iron and

500 tons high manganese iron for the second quarter, and 2000 tons of malleable iron and 4500 tons high silicon foundry iron for the third quarter. A portion of this iron has been placed.

Low phosphorus iron has become very active and is higher. A local interest reports sales aggregating 5000 tons at \$48 and 900 tons at \$49, mostly for delivery up to September.

We quote delivered Cleveland as follows:

Basic .....	\$40.40 to \$43.40
Northern No. 2 foundry, sil. 1.75 to 2.25 .....	42.40 to 43.40
Southern foundry, sil. 2.25 to 2.75 .....	46.25 to 46.60
Gray forge .....	41.40
Ohio silvery, sil. 8 per cent. ....	58.40
Standard low phos., Valley furnace ..	48.00 to 49.00

**Coke.**—The coke situation shows no improvement. Shipments apparently are as bad as ever on account of the car shortage, and many foundries are not able to keep running full capacity. There are many inquiries for prompt shipment of coke, but none is being offered.

**Old Material.**—The scrap market continues dull and weak. There is some activity among dealers, but no buying whatever by mills in the Cleveland or Valley districts. A few days ago dealers were paying \$27.50 to \$28 for heavy melting steel delivered to Valley mills, but probably would not pay over \$27 to-day. We note the sale of 1000 tons of heavy steel scrap for delivery to a Cleveland mill at \$26.50 and another lot for local delivery at \$27. Borings and turnings are quiet and the latter are lower. We note a sale of machine shop turnings at \$17 to a Cleveland dealer. Sales of borings are reported at under \$21, delivered to a Valley mill, and at \$18 in Detroit. Cast scrap is still very firm and has sold at \$40 net for a small lot. The embargo against the McKinney Steel Co. has not yet been lifted.

We quote delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel .....	\$26.00 to \$26.50
Steel rails, under 3 ft. ....	30.00 to 31.00
Steel rails, rerolling .....	33.75 to 34.50
Iron rails .....	32.00 to 33.00
Iron car axles .....	41.00 to 42.00
Steel car axles .....	36.00 to 37.00
Low phos. melting scrap .....	30.00 to 31.00
Cast borings .....	18.50 to 19.00
Iron and steel turnings and drillings ..	16.50 to 17.00
Short turnings for blast furnaces ..	18.50 to 19.00
Compressed steel .....	22.50 to 23.00
Railroad wrought .....	29.00 to 30.00
Railroad malleable .....	32.00 to 32.50
Agricultural malleable .....	27.00 to 28.00
Steel axle turnings .....	23.00 to 24.00
Light bundled sheet scrap .....	18.50 to 19.00
No. 1 cast .....	40.00 to 41.00
No. 1 busheling .....	22.50 to 23.00
Drop forge flashings, over 10 in. ....	21.00 to 21.50
Railroad grate bars .....	30.00 to 31.00
Stove plate .....	30.00 to 31.00

**Finished Iron and Steel.**—The scarcity of steel for early requirements is daily growing more acute and consumers are relying more and more on warehouse stocks wherever they can be found. The fuel shortage is apparently worse and is preventing full operation of a number of mills. Specifications are heavy and some selling agencies are urging customers to make efforts to secure shipment on orders already entered rather than to load up mill books with additional specifications. There are some inquiries for second and third quarter contracts, but these are being generally turned down. Some building work is being held up because fabricators are unable to secure quotations from mills and consequently cannot bid on work. For the new Cleveland plant of the Fisher Ohio Body Co., 1500 tons of structural material has been placed with a Chicago warehouse at 3.71c. delivered and 5500 tons of reinforcing bars for this plant are reported to have been placed with a Pittsburgh mill at 4c. A Pittsburgh mill that has been shipping considerable material from Cleveland to its Chicago warehouse has advanced its price \$10 per ton on structural material and has taken a 300-ton lot from a Cleveland fabricator at the advance, the steel costing 4.21c. delivered. The Russell Wheel & Foundry Co., Detroit, has taken 3500 tons for an addition to the Dodge Bros. plant and the Fort Pitt Bridge Works has taken 700 tons for a building for the Elmira Foundry Co., of Elmira, Ky., and there is an inquiry for 800 tons for an addition to the Plain Dealer

Building, Cleveland. The acuteness of the shortage in sheets is indicated by the purchase of a carload lot of sheets in Seattle at 9.50c. for delivery in Cleveland. For mill shipment 5.50c. to 6c. for black, 4.50c. to 4.75c. for blue annealed, and 6.75c. for galvanized apparently represent present prices. Plates are unchanged at 4c., but local mills are temporarily out of the market. A new Cleveland company that will make building forms is inquiring for 10,000 tons of reinforcing bars for second and third quarter delivery. Stocks are getting lower in local warehouses. One jobber is quoting steel bars at 3.92c., but as high as 5c. is being asked.

## San Francisco

SAN FRANCISCO, Feb. 10.

The Metal Trade Association is adhering rigidly to its refusal to confer with the leaders of the union and the shops affiliated with that organization are as determined as ever to continue operation under the American plan of open shop. The shipyards report constant addition to their forces, and it is stated that this week 60 highly skilled workers from the Northwest, who favor open shop conditions, will be added to their forces. A plan of loaning workers to shops less fully supplied has been adopted.

Some shops have induced some of their onetime employees who are regarded as most trustworthy and skillful to buy into the company and these men have returned to work in their "own shop." This seems to be a solution that may be adopted by more of the smaller shops which are standing for the open shop.

The general situation in iron and steel shows no improvement so far as supplies are concerned. The demand continues to increase, and the materials manufactured on this coast are all sold in advance of manufacture. Shipments from the East show no improvement and no relief is looked for until transportation facilities improve.

**Bars, Sheets and Plates.**—Bars continue in strong demand. While there is no job in sight demanding large quantities, there is a very large demand for reinforcing bars in the many smaller structures being erected in all parts of the state and throughout the coast. Jobbers report their stocks show further depletion on both sheets and plates. Tank plate is showing a constantly increasing demand.

**Pig Iron.**—Arrivals of pig continue to be below the average, and the announcement by a broker that he has a car of pig for sale brings many offers. It is not apparent that the consumption of pig is increasing, but the present demand seems far ahead of the supply.

**Pipe.**—The situation regarding wrought pipe seems worse. The jobbers are entirely out of some sizes and the arrivals are not sufficient for them to build up a reserve in any dimensions. A number of municipalities are calling for bids for bonds, the proceeds of which are to be used in municipal water works. From this a very large demand for cast pipe is predicted.

The Marin Municipal Water District has recently signed a contract for sale of water to the California and Hawaiian Sugar Refining Co., whose plant is at Crockett. This involves the construction of a long pipe line to Point San Quentin. Twelve-in. cast iron pipe will be used and bids are to be called for in the near future.

**Structural Steel.**—Plans of new steel frame buildings from 12 to 15 stories are being announced here at frequent intervals. The latest is to be the Matson building at Market and Main streets, which is to be 15 stories and will be used to house the various Hawaiian interests in this city. The McClintic-Marshall Co. has received the contract for 2000 tons of steel for the Scandinavian Bank, Seattle.

**Old Material.**—The market for scrap remains steady this week, as the dealers continue to deliver at \$26.50 per net ton. It is stated that almost no scrap is arriving to take the place of the scrap now being delivered, and the future appears uncertain.



## Philadelphia

PHILADELPHIA, Feb. 17.

Railroad buying, which is expected to assume sizable proportions soon after the return of the roads to private ownership on March 1, has begun in this market. The Pennsylvania Railroad has inquiries out for 7000 tons of plates, 2000 tons of shapes and 1000 tons of bars for earliest possible delivery and the Baltimore & Ohio Railroad is expected to close shortly for 5000 tons of plate. The Philadelphia & Reading and the Norfolk & Western are in the market for smaller tonnages. All of this material is for car repairs.

Meanwhile, the situation as to production is such as to discourage most steel companies from taking any further business even for as necessary work as car repairs. The shortage of coal and coke has slowed down most of the steel plants to about 50 per cent or less. An extreme case is the plight of one Eastern manufacturer of plates, who has been obliged to shut down all but two of 22 open-hearth furnaces because of coal shortage. The company's plate mills are being kept in operation on stock ingots. Another and larger interest is in bad shape, having several of its blast furnaces banked and about half of its open-hearth furnaces are out because of coal shortage.

Car shortage is affecting shipments of pig iron and there is a demand for spot iron from foundries, though the pig iron market as a whole is not active. Some grades of scrap are slightly softer, No. 1 heavy melting steel being off at least \$1 a ton.

**Pig Iron.**—The pig iron market is quiet, though the car shortage has forced some foundries to come into the market for spot iron, as shipments are not coming on schedule from their regular sources of supply. Some off-grade foundry iron has been sold at concessions, several lots high in sulphur having gone at \$39 to \$41, furnace. Prices for standard foundry iron are firm, however. Dealers say that they cannot get sufficient spot iron to supply the demand. One or two reported sales of basic, amounting to 2000 or 3000 tons each, have not been confirmed, but the probable quotations on any business would be \$40 to \$41, furnace. A Newark, N. J., steel company is in the market for 5000 tons of basic. A small tonnage of Bessemer iron has been sold in this district at slightly over \$44, delivered. Standard low phosphorus iron is firm at \$50, furnace, and copper bearing low phosphorus is being sold at \$47, furnace, mostly for second half delivery, as furnaces are sold up for first half. Virginia iron is being sold on the basis of \$42, furnace, for 1.75 to 2.25 per cent silicon, while eastern Pennsylvania foundry is at least \$1 higher at furnace.

The following quotations are for iron delivered in consumers' yards in Philadelphia or vicinity, except those for low phosphorus iron, which are f.o.b. furnace:

Eastern Pa., No. 2X, 2.25 to 2.75 sil.	\$45.35 to \$46.35
East. Pa., No. 2 plain, 1.75 to 2.25 sil.	44.10 to 45.10
Virginia No. 2 plain, 1.75 to 2.25 sil.	46.10
Virginia No. 2X, 2.25 to 2.75 sil.	47.35
Basic deliv. Eastern Pa.	41.40
Gray forge.	40.50 to 41.50
Standard low phos. (f.o.b. furnace)	50.00
Malleable	45.15
Copper bearing low phos. (f.o.b. furnace)	47.00

**Ferroalloys.**—The demand for ferromanganese for second half is light, but sales are being made at \$160, delivered, for 76 to 80 per cent. Domestic makers are sold up for first half. Some British alloy is available for second half at \$150, seaboard.

**Semi-Finished Steel.**—Open hearth rerolling billets are higher, having been sold at \$57.50 and \$60, Pittsburgh, with a freight rate of \$4.10 to Philadelphia. The lower price has been granted by one company to some of its regular customers on small lots, but \$60 is probably the minimum at which any other inquiry would be figured. A railroad company has bought a quantity of forging billets at \$70, but this also is minimum, sales having been made at \$75, Pittsburgh, and one company has sold from stock at \$80, Pittsburgh. We quote open-hearth rerolling billets, Philadelphia, at \$61.60 to \$64.10.

**Plates.**—One large Eastern plate manufacturer has been seriously affected by coal shortage. Since last week the company has been obliged to shut down all but two

of its open hearth furnaces because of insufficient coal. While the plate mills have been running they have been using up stock ingots. This company states that it is just as difficult for plate makers to get coal as it is for steel buyers to get steel. Another important Eastern mill is not so seriously affected, and is taking some business at 4c., Pittsburgh, with the understanding that specifications are to be given in second quarter with delivery at mill convenience. Railroad inquiries for car repairs are in the market, the Pennsylvania asking for 7000 tons of plates, in addition to other steel; the Baltimore & Ohio wants 5000 tons, and the Philadelphia & Reading and the Norfolk & Western are anxious to place orders for smaller tonnages. There is inquiry also from shipbuilding plants, one in Virginia asking for 8000 tons for delivery in midyear and another Eastern yard wants 2100 tons. On such business as is being taken for fairly early delivery, the market is easily quotable at 4c. to 4.25c., Pittsburgh.

**Structural Shapes.**—An Eastern company expects soon to open its books to regular customers for limited tonnages of shapes and the price will be 4c., Pittsburgh. Other Eastern mills are quoting on so little material as to be virtually out of the market. The Pennsylvania Railroad wants 2000 tons of shapes for car repairs, with earliest possible delivery. One Eastern company now has 110,000 tons of shapes in its storage yards, and its standard mills are not operating. Prices quoted on standard shapes, when quotations are obtainable, are 3.75c. to 4c., Pittsburgh.

**Bars.**—The bar situation cannot be said to have improved and consumers are experiencing great difficulty in locating even the smallest tonnages of soft steel bars. One Eastern producer will sell only forging quality and its price is 4.75c., Pittsburgh. The Pennsylvania Railroad is in the market for 1000 tons of steel bars. Demand for bar iron has fallen off following the recent advance to 4c., base, Pittsburgh. One or two small mills are still quoting 3.50c., but are able to take only a limited amount of business.

**Old Material.**—A large Eastern steel company has purchased 10,000 tons of heavy melting steel at \$25, delivered, and about the same tonnage of borings and turnings at \$19.50, delivered. Otherwise the market is quiet so far as demand from consumers is concerned, but there has been active trading between dealers and brokers to apply on orders recently taken. The market is distinctly softer on some grades, while others, such as No. 1 railroad wrought and borings and turnings, show an upward trend. Dealers expect that the market will continue quiet, with the possibility of some further recession in prices, until the steel plants are able to increase production sufficiently to require more scrap. We quote for delivery at consumers' works in this district as follows:

No. 1 heavy melting steel	\$25.00 to \$26.00
Steel rails rerolling	35.00 to 36.00
No. 1 low phos., heavy, 0.04 and under	32.00 to 33.00
Car wheels	40.00 to 45.00
No. 1 railroad wrought	36.50 to 37.50
No. 1 yard wrought	30.00 to 32.00
No. 1 forge fire	21.00 to 22.00
Bundled skeleton	21.00 to 22.00
No. 1 busheling	24.00 to 25.00
No. 2 busheling	18.50 to 19.50
Turnings (short shoveling grade for blast furnace use)	19.00 to 20.00
Mixed borings and turnings (for blast furnace use)	19.00 to 20.00
Machine-shop turnings (for rolling mill and steel works use)	20.00 to 21.00
Heavy axle turnings (or equivalent)	22.00 to 23.00
Cast borings (for rolling mills)	24.00 to 25.00
Cast borings (for chemical plant)	28.00 to 30.00
No. 1 cast	39.00 to 40.00
Railroad grate bars	32.00 to 33.00
Stove plate	30.00 to 31.00
Railroad malleable	30.00 to 31.00
Wrought iron and soft steel pipes and tubes (new specifications)	25.00 to 26.00
Iron car axles	45.00 to 46.00
Steel car axles (f.a.s. New York for export)	39.00 to 40.00

**Sheets.**—There are practically no sheets available. If occasionally some mill takes a small order to help out a regular customer, the transaction is not openly reported. Such business as has been taken by an Eastern mill rolling blue annealed sheets has been at 4.80c., Pittsburgh. Consumers have offered 5c.

**Nuts.**—Eastern makers of hot pressed nuts have advanced prices and are now quoting 1.75c. per lb. off list for tapped and 2c. per lb. off list for blank. Some Western makers are quoting list.

**Rails.**—Some inquiries for rails from industrial concerns have been received, but the market is quiet as to railroad inquiry. Meanwhile the mills are trying to get out the tonnages recently commandeered for the Railroad Administration. An Eastern mill has quoted 3.25c., mill, on 200 tons of 40-lb. rails.

## British Tendency Still Upward

### Iron Ore Prices Advancing—Tin Plates and Galvanized Sheets Higher—Pig Iron Scarce

(By Cable)

LONDON, ENGLAND, Feb. 16.

The pig-iron market is unchanged except that the price of Cleveland basic iron has been advanced 5s to £9 5s for domestic consumption. West Coast hematite is up £1 to £12 5s as the domestic quotation. A general advance in Cleveland foundry and forge iron is considered inevitable, due to the inflation in costs which have already wiped out the last advance. Export business is almost hopeless owing to the scarcity of iron and 230s. is quite a nominal figure for No. 3 Cleveland iron. An advance is also expected in hematite iron, the export quotation for which is nominal at 250s.

Iron ore prices are still rising, the best Rubio being quoted at 67s c.i.f. Middlesbrough.

The output of steel is not improving and the congestion is unrelieved. The tin-plate market exhibits a firmer tendency after a reaction and further wage demands are predicted by the end of March. There is an active general inquiry and 30,000 oil sizes are wanted for first half delivery. Buyers are bidding 74s for quarters, but sellers cannot be found and workmen are unwilling to handle small sizes. Demand for galvanized sheets is unabated with the basis price £51 f.o.b.

We quote per gross ton, except when otherwise stated, f.o.b. makers' works, with American equivalents figured at \$3.36 for £1, as follows:

	f	s.	d.	f	s.	d.	
Ship plates .....	23	10	0	to	26	10	0 \$78.96 to \$89.04
Boiler plates .....	27	10	0	to	30	0	0 92.40 to 100.80
Tees .....	21	10	0	to	24	10	0 72.24 to 82.32
Channels .....	20	15	0	to	23	15	0 69.72 to 79.80
Beams .....	20	10	0	to	23	10	0 68.88 to 78.96
Round bars, ¾ to 3 in.	23	0	0	to	25	10	0 77.28 to 85.68
Rails, 60 lb. and up.	19	15	0	to	20	5	0 66.36 to 68.88
Billets .....	23	0	0				77.28
Steel hoops .....	28	15	0	to	29	0	0 96.60 to 97.54
Tin plates .....	0	70	0	to	0	74	0 11.76 to 12.43
Sheet and tin plate bars.							
Welsh .....	23	0	0	to	30	0	0 77.28 to 100.80
Galv. sheets, 24 g.	51	0	0				171.36
Cleveland basic iron	9	5	0				31.08
West Coast hematite	12	5	0				41.16
Cleveland No. 3 foundry (export)	11	10	0				38.64

The above prices are more or less nominal.

### Legality of Increased Railroad Rates Questioned—Tin Plate Wages Increased

LONDON, ENGLAND, Feb. 2.—Prices of foreign ore have been moving upward. Sellers have been cautious and tonnage is scarce, but it is understood that boats have been recently diverted to Spanish and Mediterranean ports which has improved the freight position. The price of best 50 per cent Bilbao rubio is about 48s., c.i.f. Middlesbrough, on a 17s. freight basis, which makes the price about 62s. per ton. There is still a scarcity of coke. While the demands from every direction are so important it is regrettable that the restarting of additional furnaces is not yet possible. It is understood that there are quite a number of furnaces ready for work, but increase in pig-iron production is prevented by the shortage of fuel and ore, so

it must be anticipated that low output, coupled with high prices, are to continue.

The Cleveland pig iron market continues very strong, and now that the molders' strike is over, and work is being resumed in the foundries, it looks as if supplies must become even scarcer. If production could be increased matters would not be so bad, but as it is blast furnaces are working irregularly and deliveries are delayed. Makers are doing their best to see first to the needs of the home consumers, and after that to those of Allied countries, in spite of the fact that considerably higher prices are obtainable from other overseas markets.

Actual steel business being placed is not large, but this is because sellers are so scarce. The demand continues overwhelming from home and from abroad, but as order books are so well filled for months to come, business is very difficult to place. Supplies of plates are most stringent, particularly of the lighter sort, with the result that some shipbuilders, occupied with the smaller descriptions of work, have had difficulty in keeping their yards going. Somewhat similar conditions apply to thinner sheets, workers in some instances refusing to roll the lighter gages because they can earn better wages when engaged on heavy work.

A special meeting of Guest, Keen & Nettlefolds is to be held in Birmingham on Feb. 5 to pass a resolution increasing the capital by the creation of 2,000,000 ordinary shares of £1 each and 3,000,000 second cumulative preference shares of £1 each. The increase in capital is necessary to carry out the arrangement of purchasing a controlling interest in Messrs. John Lysaght, Ltd.

The Stanton Ironworks Company, near Nottingham, has entered into an arrangement under which it purchases as from Jan. 1 the ironworks, foundries and ore properties of James Oakes & Co., excluding the collieries and clay works.

An interesting point has arisen in regard to the new railroad rates, their legality being questioned by the Federation of British Industries, and it seems as if a test case might be the result. It is understood that the suggestion is that the Ministry of Transport failed to take all the preliminary steps necessary under the provisions of the Ministry of Transport Act.

It appears that on the grounds that they should share in the wave of prosperity in the tin plate trade in South Wales, the workers have demanded a 50 per cent advance in wages. The matter was recently discussed before the Welsh Tiplate Industry Council and after various offers had been made the men agreed to accept 40 per cent.

The shipbuilding output of the Clyde for January consisted of ten ships aggregating 39,910 tons, which was within 90 tons of the record in January, 1912.

### Pressed Steel Car Co. Report

Gross earnings of the Pressed Steel Car Co. for 1919, according to the twenty-first annual report, amounted to \$5,338,640, the net earnings after depreciation, obsolescence, amortization, renewals, etc., amounting to \$4,265,231. The company's portion of the lot of 100,000 freight cars ordered by the Railroad Administration in 1918 was completed last August. A new cafeteria and workman's welfare building at the Allegheny plant were put in operation. The sum of \$482,468 was expended for improvements during the year. The mine of the Lincoln Gas Coal Co., a subsidiary, will have a capacity of 1000 tons per day by spring. A wheel and casting foundry is being erected for the Western Steel Car & Foundry Co., another subsidiary, and plans are under way to add car and locomotive repair departments. A few months ago this company acquired a substantial interest in the American Steel Co. of Cuba, a company having a car and structural business, with plants located at Havana.

### Machine Tools for Hawaii

The Honolulu Iron Works has issued a list for \$100,000 worth of machine tools, comprising complete equipment for a machine shop.



## NO SUNDAY WORK

### New Working Schedule at Haselton Plant—Labor Shortage at Youngstown

YOUNGSTOWN, OHIO, Feb. 16.—Producers in this district started the week with appreciably improved schedules, though production is still considerably below normal. The larger plants are endeavoring to keep as many departments operating as possible with the diminished fuel rations. Inadequacy of box car supply is clogging finishing mills and is certain to interfere with schedules unless relief is provided.

Under a new working schedule, effective Feb. 16, Sunday work is eliminated at the hot mills of the Haselton, Ohio, plant of the Sharon Steel Hoop Co., Sharon, Pa. Heretofore millwrights have been compelled to work Sundays to make necessary changes in the rolls, but this is eliminated under the new arrangement. Operations now begin at 12.15 a. m. each Monday, instead of 6 a. m. and the last turn for the week ends at 8 a. m. Saturday. This gives the mechanical force an opportunity to change the rolls on Saturday. Sunday work has been reduced to a minimum at all Valley plants and the Haselton mills are the last in the Youngstown district to adopt the new plan. The management of the company has frequently asked for the change which has never been approved until recently by Fairview lodge of the Amalgamated Association of Iron, Steel and Tin Workers, to which the organized employees of these mills belong.

Labor shortage and sickness among the operating forces is still a deterrent to increased output. Larger production, however, depends primarily on railroad car supply and the efficiency and dispatch of movement of raw materials and finished products. Some district executives are inclined to feel there will be little improvement in railroad operating conditions for some time, at least not until more favorable weather. In the meantime, the mills are concentrating energies to obtain coal supplies, with what success diminished output indicates.

In view of delayed rollings, sheet makers are endeavoring to supply their customers equitably and are distributing production as fairly as possible. Schedules have been worked out so that part shipments can be made to nearly all regular customers. Many buyers have come to the district within the past two months to impress upon manufacturers the urgency of their requirements and where they have been steady customers the mills have endeavored to take care of them. It is unlikely new business will be taken in volume until well in the third quarter.

Resumption of its Atlantic furnace by the Republic Iron & Steel Co. is an indication of somewhat steadier coal supply.

## January Steel Ingot Output

Steel works in the United States produced 3,530,480 gross tons of ingots in the month of January or 130,759 tons daily for 27 working days, as compared with 3,651,913 tons or 135,523 tons a day in January, 1919. The January output was at the rate of about 40,796,652 gross tons a year, based on 312 operating days and on reports to the American Iron and Steel Institute from 30 companies which in 1918 made 84.03 per cent of the total production.

The table below gives the tonnage of steel ingots produced by these companies in 1919, except for the period of the steel strike when no statistics were compiled. It is based on reports from companies which in 1918 produced 84.03 of the total production:

Monthly Production of Steel Ingots of Companies Reporting—Gross Tons				
	Open Hearth	Bessemer	All Other	Total
January, 1919...	2,351,153	749,346	7,279	3,107,778
February .....	2,043,635	655,206	5,842	2,704,683
March .....	2,100,528	555,332	6,405	2,662,265
April .....	1,732,447	500,770	6,494	2,239,711
May .....	1,506,015	414,392	8,617	1,929,024
June .....	1,692,257	521,634	5,328	2,219,219
July .....	1,875,630	625,246	7,300	2,508,176
August .....	1,988,651	748,212	9,218	2,746,081
January, 1920...	2,241,318	714,657	10,687	2,966,662

## Mining Engineers Elect Herbert Hoover Their President

The American Institute of Mining and Metallurgical Engineers, at its 121st meeting in New York this week, elected as its new president and director Herbert C. Hoover of Palo Alto, Cal. One of the leading topics of this year's meeting was the stabilization of the bituminous coal industry. This subject, to which three sessions were devoted, one on Tuesday and two on Wednesday, was opened on Tuesday afternoon by an address by Mr. Hoover on a definite program of study and work for the institute and a constructive plan for the better working of the bituminous coal industry. Other prominent mining engineers contributed papers on this subject. The sessions on Monday were devoted largely to oil and those on Wednesday to two sessions on steel, papers on alloy steels being the prominent feature.

Other officers elected were Frederick Laist, Anaconda, Mont., and Seeley W. Mudel, Los Angeles, Cal., as vice-presidents and directors. Other directors chosen were W. M. Corse, Bayonne, N. J.; A. S. Dwight, New York; R. M. Catlin, Franklin Furnace, N. J.; G. H. Clevenger, Washington, D. C., and W. A. Carlyle, Ottawa, Canada.

At the banquet which was held at the Waldorf-Astoria on Tuesday evening Mr. Hoover was one of the leading speakers. The attendance at all of the sessions was unusually large.

## American Chain Acquires Page Steel & Wire Co.

The American Chain Co., Inc., Bridgeport, Conn., has purchased the control of the Page Steel & Wire Co., with mills at Monessen, Pa., and Adrian, Mich. It is the intention of the American Chain Co. to continue the business of the Page Steel & Wire Co. as heretofore, taking only its surplus product. The Page company plants consist of open hearth furnaces and wire mills as well as fence factories. The new officers elected under the reorganization of the company are: Walter B. Lashar, president; William T. Morris, vice-president; Wilmont F. Wheeler, treasurer; John E. Carr, assistant treasurer, and William M. Wheeler, secretary. E. C. Sattley, formerly general manager of the Page Steel & Wire Co., will continue in that capacity, with offices in the Union Arcade, Pittsburgh. The American Chain Co. has its general sales offices in the Grand Central Terminal Building, New York, and district sales offices in Chicago, Boston, Philadelphia, San Francisco, Portland and Pittsburgh.

## Acme Steel Goods Co.'s Mill

The Acme Steel Goods Co., 2840 Archer Avenue, Chicago, has let a contract for a new rolling mill building at its Riverdale plant, as was briefly noted in THE IRON AGE of Feb. 12. The building, which will be 150 x 700 ft., will be of steel frame construction, with side walls of glass and concrete, and wood block floor on concrete foundations. The structure will be completed before June 1, and will house 20 10-in. cold roll mills, which are now under construction, together with slitting machines and processing machines, to take care of the demand for light cold-rolled strip steel in various widths and gages and finishes. The company reports that its long length hoop mill, started last July, is now running on three 8-hr. shifts and exceeding estimated capacity.

## British January Iron and Steel Output

LONDON, ENGLAND, Feb. 17.

The January output of pig iron was 665,000 gross tons and the steel output was 754,000 tons as compared with 640,000 tons and 680,000 tons respectively in December. This compares with an average monthly output of pig iron in 1919 of 614,000 tons and of steel of 657,000 tons.

## Non-Ferrous Metals

### The Week's Prices

Cents Per Pound for Early Delivery						
Copper, New York		Tin, New York		Lead		Spelter
Lake	Electro- lytic			New York	St. Louis	New York
Feb. 11	19.25	19.00	58.50	8.75	8.50	9.00
13	19.25	19.00	58.50	8.75	8.50	9.05
14	19.25	19.00	...	8.75	8.50	9.10
16	19.25	19.00	59.25	8.75	8.50	9.10
17	19.25	19.00	60.00	8.75	8.50	9.10

NEW YORK, Feb. 17.

The markets are all quiet and quotations firm. The copper market is dull but prices are steady. The tin market is very quiet with values less erratic than in some time. Demand for lead is not heavy but prices are slightly firmer than a week ago. Inquiry for zinc is better with quotations slightly higher.

### New York

**Copper.**—The market has turned exceedingly quiet but producers in general look for considerably better conditions in the near future, especially if the foreign exchange situation continues to improve or remains stable. Electrolytic copper from first hands is unchanged at 19c., New York, for early delivery, with 19.25c. asked for second quarter. Lake copper is also unchanged at 19.25c., New York, for early delivery with 19.50c. asked for second quarter. Small quantities of electrolytic copper are obtainable in the outside market at around 18.50c. to 18.75c., New York.

**Tin.**—Consumers in general have remained aloof. Buying has been for spot delivery, mostly to dealers, but the volume has been small. There is evidence that supplies of spot tin are being concentrated, that some interests are buying up reserves and that the metal is passing into stronger hands. Sellers who were pressing the market a short time ago are not pursuing this course at present. Yesterday there was a considerably more active demand but buyers seemed to be reluctant and it is believed not much business resulted. In the morning spot tin was quoted as high as 59.75c., with 59.25c. asked at the close of the day. To-day spot Straits tin is quoted at 60c., New York. Prices for this position have been steady because of the better situation in foreign exchange. Dealing in futures has been practically nil. Arrivals thus far this month have been 2670 tons and the quantity afloat is reported as 5445 tons. The London market is strong with spot Straits quoted to-day at £392 per ton.

**Lead.**—There is not much demand and what metal is being sold is probably going at 8.75c., New York, or 8.50c., St. Louis, if the leading interest is taking any business. The outside market, if anything, has advanced higher, quotations as high as 8.80c. to 8.85c., New York, being noted.

**Zinc.**—There has been a fairly active inquiry from galvanizers and brass makers in the last few days, mostly for early delivery, indicating that their stocks are being reduced. They have not, however, entered the market to any extent for second quarter, but are expected to do so shortly. The steadiness in foreign exchange has been reflected here in steadier prices to which the more active domestic inquiry has also contributed. Prime Western for early delivery is quoted at 8.75c., St. Louis, or 9.10c., New York, with some sellers offering April or May delivery at the same level.

**Antimony.**—The market is stronger and higher with wholesale lots for early delivery quoted at 11.62½c., New York, duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is obtainable in wholesale lots for early delivery at 31c. to 33c., New York.

**Old Metals.**—The market is quiet. Dealers' selling prices are reported as follows:

	Cents per lb.
Copper, heavy and crucible	19.00
Copper, heavy and wire	18.00
Copper, light and bottoms	16.50
Brass, heavy	14.00
Brass, light	10.00
Heavy machine composition	19.00
No. 1 yellow rod brass turnings	12.00
No. 1 red brass or composition turnings	16.00
Lead, heavy	7.50
Lead, tea	5.50
Zinc	9.70

### Chicago

Feb. 17.—The market is generally stronger, there being good buying in all the metals. Copper is the most sluggish but shipments against old orders are heavy. Tin has been in good demand and is particularly stiff because the snow blockade in the East prevented shipments from leaving New York. It has advanced 2c. to 3c. Inquiry for lead is strong and, while there seems to be an ample supply, sellers are showing a decreasing disposition to take orders. Spelter declined during the week but has since advanced to about 1/5c. above the quotation of Feb. 10. Sellers claim to have more inquiry than they can take care of and are refusing to quote for distant delivery as they anticipate further advances. More antimony has been sold in the past two weeks than during a similar period for some time. This metal is in good demand and stronger, some importers being of the opinion that higher prices are due. Old grades of copper and brass have declined about 1c. each, and block tin has fallen 2½c.

We quote Lake copper 19.50c. for carloads, tin 61c. to 62c., lead 8.50c. to 8.62½c., spelter 9.10c., and antimony 12.50c. On old metals we quote copper wires, crucible shapes, 15.50c.; copper clips, 15.25c.; copper bottoms, 14c.; red brass, 15.50c.; yellow brass, 11.25c.; lead pipe, 6.75c.; zinc, 6.25c.; pewter, No. 1, 37.50c.; tinfoil, 40c., and block tin, 50c., all these being buying prices for less than carload lots.

### St. Louis

Feb. 16.—The non-ferrous markets have been quiet and steady. Car lot quotations of lead are 8.50c. to 8.62½c.; spelter, 9.25c. In less than carlots the quotations have been: Lead, 9.10c.; spelter, 9.75c.; tin, 65c.; copper, 20c.; antimony, 14c. In the Joplin district ores have been quiet at the drop registered early last week when zinc blende receded to \$51, top price for 60 per cent ore. Calamine ranged around \$35 basis 40 per cent, while lead ore held steady at \$100 basis 80 per cent. The scrap metal markets are quiet. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 8c.; heavy yellow brass, 10c.; heavy red brass, 15c.; light copper, 13c.; heavy copper and copper wire, 16c.; zinc, 5c.; lead, 5c.; tea lead, 3c.; tinfoil, 43c.; pewter, 35c.; aluminum, 22c.

The fifth annual meeting of the Society of Ohio Safety Engineers was held at the Old Colony Club, Cleveland, Feb. 13, being followed by a banquet. J. M. Woltz, safety director of the Youngstown Sheet & Tube Co., Youngstown, Ohio, was re-elected president. E. R. Rose, director of safety of the Republic Iron & Steel Co., Youngstown, who has been both secretary and treasurer, was re-elected treasurer, and C. E. Pettibone, Pickands Mather & Co., Cleveland, was made secretary.

After being shut down for more than a week because of the fuel shortage, the 16- and 26-in. mills of the Steelton, Pa., plant of the Bethlehem Steel Co. have resumed operations. The situation, however, continues critical; the open hearth and 44-, 28- and 13-in. mills remain closed and will likely not resume operation until next week. Before the resumption of operation of the 16- and 26-in. mills, production had been curtailed more than 50 per cent.

Arthur G. McKee & Co., Cleveland, have taken a contract from the Ford Motor Co. for two Kling-Weidlein six-unit gas cleaners for the new Ford blast furnaces in Detroit and one five-unit cleaner for the Shelton Iron, Steel & Coal Co., Ltd., Stoke-on-Trent, England.



# Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Prices quoted below represent as closely as they can be given those charged by mills to their regular trade for indefinite shipment. Owing to practical famine in supply of finished steel products and the heavy demand existing, tenders of new business are being made to the mills by jobbers and consumers at higher prices than those quoted below, but as a rule the mills are turning this offered business away.)

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Jan. 1, 1920, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 25c.; Boston, 29½c.; Buffalo, 21c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49.5½c.; Denver, 99c.; Omaha, 59c.; minimum carload 80,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, \$1.25; minimum carload 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.315, minimum carload 40,000 lb.; and \$1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload, 46,000 lb. Jacksonville, Fla., all rail, car lots, 41.5c.; less, 59c.; rail and water, car lots, 34.5c.; less, 46.5c. A 3 per cent transportation tax applies. On iron and steel items not noted above rates vary somewhat and are given in detail in the regular railroad tariffs.

## Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zebs, structural size, 2.45c. to 2.70c.

## Wire Products

Wire nails, \$3.25 to \$4.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.50, and shorter than 1 in., \$2.00. Bright basic wire, \$3 to \$3.50 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3 to \$3.50; galvanized wire, \$3.70 to \$3.95; galvanized barbed wire and fence staples, \$4.10 to \$4.45; painted barbed wire, \$3.40 to \$3.75; polished fence staples, \$3.40 to \$4.50; cement-coated nails, per count keg, \$2.85 to \$3.75; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60 per cent off list for carload lots, 59 per cent for 1000-rod lots, and 58 per cent off for small lots, f.o.b. Pittsburgh.

## Bolts, Nuts and Rivets

Large structural and ship rivets, \$4.50 base  
Large boiler rivets, \$4.60 base  
Small rivets, \$4.60 base  
Small machine bolts, rolled threads, 40, 10 and 5 per cent off list  
Same sizes in cut threads, 40 and 5 per cent off list  
Longer and larger sizes of machine bolts, 30 and 10 per cent off list  
Carriage bolts, ¾ in. x 6 in., smaller and shorter, rolled threads, 40 and 5 per cent off list  
Cut threads, 30 and 10 per cent off list  
Longer and larger sizes, 30 per cent off list  
Lag bolts, 50 per cent off list  
Flow bolts, Nos. 1, 2 and 3 head, 40 per cent off list  
Other style heads, 20 per cent extra  
Machine bolts, c.n.c. and t. nuts, ¾ in. x 4 in., smaller and shorter, 35 per cent off list  
Longer and larger sizes, 25 per cent off list  
Hot pressed and cold pressed sq. or hex. blank nuts, 2c. off list  
Tapped nuts, \$1.75 off list  
Semi-finished hex. nuts, U. S. S. and S. A. E., ¾ in. and larger, 60 and 5 per cent off list  
9/16-in. and smaller, 70 and 5 per cent off list  
9/16-in. and smaller A. L. A. M., or S. A. E., 70, 10 and 5 per cent off list  
Stove bolts in packages, 70 and 10 per cent off list  
Stove bolts in bulk, 70 and 10 and 2½ per cent off list  
Tire bolts, 55 and 10 per cent off list  
Track bolts, 6c. base  
One cent per lb. extra for less than 200 kegs. Rivets in 100 lb. kegs 25c. extra.  
All prices carry standard extras f.o.b. Pittsburgh.

## Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$52 to \$65; chain rods, \$65 to \$70; screw rivet and bolt rods and other rods of that character, \$65 to \$70. Prices on high carbon rods are irregular. They range from \$75 to \$100, depending on carbons.

## Railroad Spikes and Track Bolts

Railroad spikes, ½ to 9/16 in. and larger, \$3.60 per 100 lb. in lots of 200 kegs, of 200 lb. each or more; spikes, ¾ in. and 7/16 in., \$4.25; 5/16 in., \$5; track bolts, \$4.90 to \$5. Boat and barge spikes, \$4.25 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Tie plates, \$3 to \$4 per 100 lb.

## Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$13.80 per package; 8-lb. coating, I. C., \$14.10; 12-lb. coating, I. C., \$15.80; 15-lb. coating, I. C., \$16.80; 20-lb. coating, I. C., \$18.05; 25-lb. coating, I. C., \$19.30; 30-lb. coating, I. C., \$20.30; 35-lb. coating, I. C., \$21.30; 40-lb. coating, I. C., \$22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

## Iron and Steel Bars

Steel bars at 2 35c. to 3.00c. from mill. Common bar iron, 4.00c.

## Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Steel		Iron	
Inches	Black Galv.	Inches	Black Galv.
1½, 2, 2½ and 3	47	1½ and 2	1 + 25
3½	51	2½	25½ + 1½
4 to 3	54	3	29½
		3½ to 1½	34½
		2 and 2½	33½
			17½
Lap Weld			
2	47	1½	24½
2½ to 6	50	1½	31½
7 to 12	47	2	28½
13 and 14	37½	2½ to 6	30½
15	35	7 to 12	27½
Butt Weld, extra strong, plain ends			
1½, 2, 2½ and 3	43	1½	+7
3½	48	2	+40
4 to 1½	52	2½	23½
2 to 3	53	3 to 1½	34½
		2 and 2½	34½
			19½
Lap Weld, extra strong, plain ends			
2	45	1½	21½
2½ to 4	48	1½	27½
4½ to 6	47	2	29½
7 to 8	43	2½ to 4	31½
9 to 12	38	4½ to 6	30½
		7 to 8	22½
		9 to 12	17½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots and on butt and lap weld galvanized iron pipes have been nine (9) points lower (higher price).

## Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel	Charcoal Iron
3½ to 4½ in. 40½	1½ and 1½ in. +20
2½ to 3½ in. 30½	2 and 2½ in. +10
2½ in. 24	2½ and 2½ in. +1
1½ to 2 in. 19½	3 and 3½ in. — 1½
	3½, 4 and 4½ in. — 8
Standard Commercial Seamless—Cold Drawn or Hot Rolled	
Per Net Ton	Per Net Ton
1 in. \$327	1½ in. \$307
1½ in. 267	2 to 2½ in. 177
1½ in. 257	2½ to 3½ in. 167
1½ in. 207	4 in. 187
	4½ to 5 in. 207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiations.

## Sheets

Prices of the Steel Corporation for mill shipments on sheets of United States standard gage in carloads and larger lots for indefinite delivery are given in the left-hand column. For reasonably prompt delivery, mills have no trouble in getting prices quoted in the right-hand column, or even higher prices.

## Blue Annealed—Bessemer

Nos.	Cents per lb.
Nos. 8 and heavier	3.50 to 4.00
Nos. 9 and 10 (base)	3.55 to 4.05
Nos. 11 and 12	3.60 to 4.10
Nos. 13 and 14	3.65 to 4.15
Nos. 15 and 16	3.75 to 4.25

## Box Annealed, One Pass Cold Rolled—Bessemer

Nos.	Cents per lb.
Nos. 17 to 21	4.15 to 4.65
Nos. 22 to 24	4.20 to 4.70
Nos. 25 and 26	4.25 to 4.75
No. 27	4.30 to 4.80
No. 28 (base)	4.35 to 4.85
No. 29	4.45 to 4.95
No. 30	4.55 to 5.05

## Galvanized, Black Sheet Gage—Bessemer

Nos.	Cents per lb.
Nos. 10 and 11	4.70 to 5.20
Nos. 12 to 14	4.80 to 5.30
Nos. 15 and 16	4.95 to 5.45
Nos. 17 to 21	5.10 to 5.60
Nos. 22 to 24	5.25 to 5.75
Nos. 25 and 26	5.40 to 5.90
No. 27	5.55 to 6.05
No. 28 (base)	5.70 to 6.20
No. 29	5.95 to 6.45
No. 30	6.20 to 6.70

## Tin-Mill Black Plate—Bessemer

Nos.	Cents per lb.
Nos. 15 and 16	4.15 to 4.65
Nos. 17 to 21	4.20 to 4.70
Nos. 22 to 24	4.25 to 4.75
Nos. 25 to 27	4.30 to 4.80
No. 28 (base)	4.35 to 4.85
No. 29	4.40 to 4.90
No. 30	4.40 to 4.90
Nos. 30½ and 31	4.45 to 4.95

## PERSONAL

John A. Topping, chairman of the board of the Republic Iron & Steel Co., has left for a month's stay in California, most of the time in Pasadena.

C. H. Hutchins, coke sales department, New England Coal & Coke Co., Boston, is now associated with the Boston firm of E. Arthur Tutein, 50 Congress Street, pig iron.

Charles D. Wright, master mechanic in the rolling mills of the Steelton, Pa., plant of the Bethlehem Steel Co. for the past four years, has resigned, effective Feb. 15, to become assistant general superintendent of the Bridgeport, Conn., plant of the American Tube & Stamping Co.

Charles T. Fox, 437 Chestnut Street, Philadelphia, is no longer with Corin Brothers, Inc., exporters and importers, in any capacity or with any persons or corporations interested in that company.

M. H. Sarben, sales manager and secretary Standard Shop Equipment Co., Philadelphia, has resigned. W. M. Beury succeeds him as secretary. His plans have not been announced for the future.

William H. Doherty, formerly with the Reading Steel Castings Co., has joined the sales force of the Connecticut Electric Steel Co., Inc., Hartford, Conn.

H. E. Stocker, for a number of years production manager of the Fort Wayne Works of General Electric Co., has become general manager of Roth Brothers & Co., motor manufacturers, 1400 West Adams Street, Chicago.

B. C. Saunders, who recently resigned as sales manager of the Wilmarth & Morman Co., has purchased an interest in the Grand Rapids Grinding Machine Co., Grand Rapids, Mich., and becomes associated with it in active management. At the annual meeting just held he was elected secretary and sales manager.

The New York Central Iron Works, Inc., Hagerstown, Md., tank equipment, elected the following officers at the annual meeting Feb. 12: M. P. Moller, president; L. D. Perry, vice-president; D. A. Stickell, treasurer; William Wingert, secretary. New plant improvements include a machine shop and additional tank shop equipment, which will increase capacity about threefold. H. M. Olson has been continued as general manager. The manufacturing of Dunning boilers, which was the company's specialty, has been discontinued.

Scott Stewart, general manager W. J. Rainey and vice-president Rainey-Wood Coke Co., has been elected vice-president and a member of the board of directors of the Matlack Coal & Iron Corporation.

J. D. Apgar, formerly of the Machine Tool Engineering Co. of New York, has joined the sales force of the Van Norman Machine Tool Co., Springfield, Mass., as a direct representative in its New York office, 320 Fifth Avenue.

Herbert J. Frink, president and treasurer Holyoke Machine Co., Holyoke, Mass., cutting machinery, has been elected president of the People's Savings Bank, that city, of which he has been a trustee since its organization in 1885.

Charles Austin Hirschberg, advertising counselor, specializing in the technical field, announces that he is located in his permanent home, 426-436 Sun Building, 150 Nassau Street, New York.

H. H. Keeports, for 10 years manufacturing executive with the Anderson Forge & Machine Co., Detroit, has resigned.

Myron Arms, II., president Aetna Foundry & Machine Co., Warren, Ohio, is convalescing from an attack of the gripe which for two weeks confined him to his room at the Bellevue-Stratford hotel, Philadelphia, where he had gone on business.

F. M. Nourse has joined Charles L. Benjamin, Chicago, technical and trade advertising. He has been engineer in the advertising department of the Cutler-

Hammer Mfg. Co., Milwaukee, for the past two years and prior to that was associated with Wisconsin Power Light & Heat Co., Portage, Wis.

I. T. Kahn, president Republic Structural Iron Works Co. and the Columbian Hardware Co., Cleveland, left Feb. 13 for China, where he will spend four months on business and pleasure.

J. Rodney Weeks, superintendent Jackson Cushion Spring Co., Jackson, Mich., has resigned to go to St. Johns, Mich., where he will help in the reorganization of the F. C. Mason Co., manufacturer of implement parts and motor truck frames.

E. France has resigned as superintendent of the steel foundry of the Otis Steel Co., Cleveland, to become connected with the Erie Forge Co., Erie, Pa., as consulting engineer.

For purposes of industrial management under the firm name of Webb, Kendall & Bruce, Inc., with offices at 65 Broadway, New York, and 199 Washington Street, Boston, the following have become associated: Stuart W. Webb, Henry P. Kendall, John M. Bruce, Fred. R. Ayer, Henry J. Guild, Charles B. Wiggin.

In the consolidation of the Tacony Steel Co. and the Penn Seaboard Steel Corporation and the resultant reorganization, John B. Warren of the Tacony Steel Co. has been elected president and George Satterthwaite of the same company vice-president. Charles Hart, who was president of the Penn Seaboard Steel Corporation, has resigned.

William E. Corey, chairman of the board of the Midvale Steel & Ordnance Co., New York, will spend the month of March in Cuba.

Major Walter Alexander of Milwaukee, late chief of traffic and storage, Motor Transport Corps, has resigned as chief mechanical engineer of the Wisconsin State Highway Commission to accept the office of vice-president and general manager of the Union Refrigerator Transit Co., Milwaukee.

Edward Miles, for 30 years in the service of the Union Malleable Iron Co., Moline, Ill., has terminated his connection with that company to become superintendent of the Moline Iron Works in a new foundry recently completed on the site of the old Three-I League base ball park in that city.

J. E. Kelley, formerly with the Chain Belt Co., Milwaukee, has been appointed foundry superintendent for the Lockport Foundries Corporation, Lockport, N. Y., which will start operations in a new plant about March 1, to manufacture malleable iron unions and fittings.

Robert E. Wilbur has been appointed second vice-president of the Bethlehem Foundry & Machine Co., Bethlehem, Pa.

## OBITUARY

Captain DAVID KYLE, vice-president and director of the Algoma Steel Corporation, Sault Ste. Marie, Ont., died Feb. 8 from pneumonia, following an attack of influenza. Captain Kyle was born in Scotland and went to Sault Ste. Marie in 1910 as engineer in charge of the construction of the merchant mill, and was later in charge of the construction of the gas engines. When the work was completed, he joined the staff of the steel plant and was placed in charge of maintenance. In 1912 he was made general superintendent of operations, and in the fall of 1914 he left the service of the company to go overseas and serve in the war, during which he won the Military Cross. In 1917, by special arrangement with the military authorities in London, he was allowed to return to Canada, and again took his place in the executive offices of the steel company, and two years ago he was elected vice-president and a director of the Algoma Steel Co. He was 36 years of age.

ERNEST E. SMYTHE, general manager Western Malleables Co., Beaver Dam, Wis., died Feb. 9, following an attack of apoplexy. He was 50 years of



age. When the Beaver Dam Malleable Iron Co. was precipitated into receivership in 1913, Mr. Smythe was appointed trustee and after the reorganization of the property under the present name was elected vice-president and general manager.

L. KRYDER LACHMAN, assistant engineer in charge of the drawing-room for Frank C. Roberts & Co., Philadelphia, died of pneumonia on Feb. 8, aged 46. Mr. Lachman was born in Pottstown, Pa., and entered the employ of Frank C. Roberts & Co. more than 26 years ago. He was well known to many in the iron and steel business.

PATRICK HENRY FERGUSON, 43, manager of the New York office of the Pittsburgh Steel Products Co., died Feb. 12 of pneumonia at Richmond, Va., where he was on a business trip. His home was in East Orange, N. J.

JOHN L. VETTE, secretary Essex Motors Co. and production manager Hudson Motor Car Co., Detroit, died last week of pneumonia. He was 30 years old.

WILLIAM E. DEIHL, manager Corbin Screw Corporation, New Britain, Conn., died Feb. 12 of pneumonia after a two days' illness.

ALFRED DALE SMITH, secretary the Sherman-Klove Co., Chicago, screws, died Feb. 1.

### Koppers Co. Secures Large Contract

The H. Koppers Co., Union Arcade, Pittsburgh, has secured a contract from the People's Gas Light & Coke Co. of Chicago for the building of 120 Koppers by-product coke ovens and a complete by-product recovery plant. No figures have been given out as to the output of furnace and foundry coke, which will be sold to consumers of these products in the Chicago district. The plant will, however, have a capacity for making 10,000,000 to 12,000,000 cu. ft. of water gas and coke gas per day, which will also be sold to consumers. The cost of the initial plants will be about \$18,000,000 and the People's Gas Light & Coke Co. will create a new corporation to be called the Chicago By-Products Coke Co. The first named concern has sold to this new interest about 170 acres of land on the drainage canal on which the two plants will be built. The Chicago By-Products Coke Co. will be capitalized at \$4,500,000, and the People's Gas Light & Coke Co. will take from the Chicago By-Products Coke Co. all the gas and coke it produces. It is expected that at least 18 months will be required to build the Koppers by-product coke plant and the by-product recovery plant, this contract being one of the largest secured by the H. Koppers Co. for some time.

### Manufacturers to Meet at Waldorf-Astoria

The convention of the Material Handling Machinery Manufacturers' Association at the Waldorf-Astoria Hotel, New York, Feb. 26 and 27, will be open to all manufacturers of material handling equipment, with the exception of the morning session on Feb. 26, which will be a business meeting of the association. Speakers at the formal luncheon will be: Arthur E. Harrell, New York *Tribune*, and John F. Wahl, recently returned from Copenhagen, Denmark. Papers will be read during the two days of the convention by the following:

B. B. Fitch, president Motor Terminals Corporation, Cleveland; Capt. F. T. Chambers, United States Navy; F. L. DuBosque, superintendent, floating equipment, Pennsylvania Railroad; A. J. Barnes, advertising manager, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; F. M. Thomas, vice-president, Mathews Gravity Carrier Co.; P. C. Gunion, Hyatt Roller Bearing Co.; Anderson Pace, the *Literary Digest*; Henry W. Standart, secretary-treasurer, Northern Engineering Works, Detroit; J. C. Cone, manager, R. W. Hunt Co.; George B. Green, general manager, East Waterway Dock & Warehouse Co., Seattle, Wash.

The molders of Newburgh, N. Y., have just tendered demands for \$6.50 wages for an 8-hr. day, their present rate being \$5.50.

### Association of American Steel Manufacturers' Meeting

The regular annual meeting of the Association of American Steel Manufacturers will be held in the William Penn Hotel, Pittsburgh, on Friday, Feb. 20. This will be the twenty-fifth anniversary of the organization of this association, and the business session, which will start in the afternoon, will be followed by an informal dinner, at which the past work, usefulness of the association to its members, and other subjects, will be reviewed by several of its past presidents. At the first official meeting in 1895, a resolution that formed the permanent organization was to the effect that the association was to meet from time to time to discuss matters pertaining to the manufacture and use of steel. Its activities have always been confined to discussions of mutual benefit to its members, concerning technical and practical questions in connection with specifications for the inspection of steel products, also rolling mill practices, and the co-operation with other associations and societies on subjects of this kind with a view to standardization. Examples of the work the association is doing are shown clearly by subjects on the program of the annual meeting to be held as noted above. One of the subjects to be discussed will be "Progress Report of the Special Committee on Phosphorus and Sulphur Question." This committee represents the Association of American Steel Manufacturers on the joint committee investigating the effect of phosphorus and sulphur on steel products, and the proper limits for these elements in standard specifications. The joint committee was organized at the instance of the American Society for Testing Materials in the fall of 1919, and includes the American Railway Association, Bureau of Standards, and other Government departments.

Another subject to be considered is the report of the committee on "Allowable Variations on Check Analysis." The work of this committee is in connection with a proposed specification of the American Society for Testing Materials for commercial bar steels. Also will be heard the report of a special committee on "Proper Phosphorus Limit for Bessemer Steel Specifications." There will also be heard the report of a special committee on "The Standardization of Structural Sections." This committee was appointed to co-operate with the American Engineering Standards Committee, and through it with the British Engineering Standards Association, with a view to the international standardization of structural sections, particularly shipbuilding sections.

Another subject will come up entitled "Report of the Special Committee on Plate Subjects." This committee has been investigating the request of subcommittee III of the American Society of Testing Materials for a special table of rolling tolerances for ship plates.

While the association has never adopted a formal constitution or by-laws, rules have been established from time to time for the conduct of its business, and in accordance with one of these, the nominating committee proposed the following ticket for officers for the ensuing year: For president, Robert H. Irons, president Central Iron & Steel Co., Harrisburg, Pa.; for vice-president, Jesse J. Shuman, inspecting engineer, Jones & Laughlin Steel Co., Pittsburgh; for secretary-treasurer, J. O. Leech, manager, Bureau of Inspection and Tests, Carnegie Steel Co., Pittsburgh.

### Structural Business Active in January

The structural contracts taken by bridge and fabricating plants of the country in January amounted to 135,000 gross tons or 75 per cent of their capacity, according to the records of the Bridge Builders and Structural Society, 50 Church Street, New York, as compiled by George E. Gifford, secretary. This is 50 per cent more business than the average for the month for the preceding eight years. Only 12 per cent of capacity was booked in January, 1919, and but 69 per cent in January, 1916, the high point for the month in that period. It is, however, slightly under the average for last six months of 1919, which was 77 per cent.

## Short Trade Items

At the first annual meeting of the Bessemer Limestone & Cement Co., Youngstown, Ohio, recently formed to take over the Bessemer Limestone Co., G. G. Treat was elected secretary and treasurer and Henry A. Butler was added to the board of directors. Mr. Treat was formerly secretary and assistant treasurer and replaces John R. Rowland, retired, as treasurer. The company markets annually about 800,000 tons of limestone, 600,000 tons of which are supplied to blast furnaces in the Mahoning and Shenango valleys to be used as blast furnace flux. It is erecting a new cement plant at its properties, Bessemer, Pa., to have an annual capacity of 1,000,000 bbl. Directors and officers were re-elected. John Tod is president and Fred R. Kanengeiser is vice-president and general manager.

Stock control of the John Russell Cutlery Co., Turners Falls, Mass., has passed into new hands. Lewis D. Bement, for 20 years associated with the Dennison Mfg. Co., Framingham, paper novelties, is now president, and Alex McL. Rowland, Westfield, N. J., vice-president and assistant treasurer. During the past year or so the cutlery company's plant has been electrified. It is the intention of the new management to add new equipment as fast as possible.

The Youngstown Sheet & Tube Co. has blown in No. 2 furnace at Hubbard, Trumbull County, but has suspended No. 3 in the East Youngstown group for relining. Five of its six furnaces are pouring, three at East Youngstown and two at Hubbard. Only four of six batteries of by-product coke ovens of 51 units each are operating.

The Graton & Knight Mfg. Co., Worcester, Mass., leather beltings, etc., has bought the leather belting plant of E. R. Ladew, Inc., Glen Cove, N. Y., several million dollars being involved in the deal. The Ladew concern was organized in 1845, and established its main factory at Glen Cove in 1903. The new owners expect to continue operations as heretofore.

Freyn, Brassert & Co., engineers, Chicago, have been retained as consulting engineers by Edmund M. Mudge & Co., of Pittsburgh, in connection with the construction of a new 400-ton blast furnace stack at the Claire furnace plant, Sharpsville, Pa.

Julius Blum & Co., tubing, have just moved to their new offices and warehouse at 540 West Twenty-second Street, New York, which is equipped with novel and modern devices for handling material.

The Columbia Steel Co., 503 Market Street, San Francisco, will have its new rolling mills at Pittsburgh, Cal., in operation, enabling it to commence shipments in April. It maintains a steel foundry at Portland, Ore.

The name of the W. A. Wilson Machine Co., 215 North Water Street, Rochester, N. Y., has been changed to the Merley Machinery Corporation, same address.

Work has been started on the new labor bureau building costing \$75,000 for the American Steel & Wire Co., North Works, Worcester, Mass.

The Dravo Contracting Co., Pittsburgh, recently launched two steel barges for the United States Railroad Administration. The barges are of the open type, 300 ft. long, 48 ft. beam and 11 ft. deep, with a cargo carrying capacity of 3000 tons. They are for the upper Mississippi River trade and will carry ore and oil. Each barge is fitted with 22 water-tight compartments.

The McKeesport Tin Plate Co., McKeesport, Pa., has given common labor and skilled workmen in its plant an average advance of 10 per cent in wages.

The corporate name of the Anderson Forge & Machine Co., Detroit, was changed at a stockholders meeting held on Feb. 6, to the Jefferson Forge Products Co.

The capital stock was increased by \$300,000, all of which was subscribed by the present stockholders. This brings the total capitalization to \$1,000,000. The officers and organization remain the same as formerly. The company will continue the manufacture of drop forgings and finished crankshafts.

Furnace No. 1 of the American Manganese Mfg. Co. at Dunbar was fired on Friday, Feb. 13. The furnace has been refitted and equipped with a skip hoist at a cost of \$200,000, giving the plant a daily capacity of 300 tons of iron. The improvements were made under the direction of L. S. Kerchner, who has lately been transferred to the Pittsburgh office of the company.

The Erie Forge Co., Erie, Pa., is converting the plant of the Erie Forge & Steel Co. into a steel foundry. This plant, which is equipped with open-hearth furnaces, was built by the Government and was operated by the Erie Forge Co. during the war for the manufacture of forgings for the Navy Department and was recently purchased from the Government by the latter company.

The Gardner-Bryan Co., Cleveland, has been appointed special representative for the Precision & Thread Grinder Mfg. Co. in Ohio, Indiana and Western Pennsylvania. The Precision company manufactures the multi-graduated Precision grinder.

The Bessemer Gas Engine Co., Grove City, Pa., manufacturer of Bessemer gas and oil engines, has purchased ground near its present plant on which it will build a large foundry and pattern shop to cost about \$250,000. The company also plans to build a number of houses for its employees, but definite plans have not been made.

The Norting Rotary Engine Co., 917 Ashland Block, Chicago, announces that it will add to its products a line of ½-ton chain hoists, a feature of which will be the use of Lynite, an aluminum alloy, for the gear case and other stationery parts.

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, at the recent annual meeting of its stockholders approved plans for the increase of the capital stock to \$3,500,000 to provide for extensions, including a new open-hearth steel plant. W. H. Davey was re-elected president and treasurer, but retires from the office of general manager, Samuel Davey, the second vice-president, being elected in his place as general manager.

Recently the Westinghouse Electric & Mfg. Co., East Pittsburgh, paid off \$15,000,000 of notes out of earnings.

The Republic Iron & Steel Co. has blown in Atlantic furnace at New Castle, Pa., out of blast since early last year. It is one of two producing stacks owned by the Republic company in the Shenango Valley, the other being Hall furnace at Sharon, Pa., which is idle. All of its six furnaces in the Haselton group at Youngstown, Ohio, are active. With these seven producing furnaces the company can turn out 3000 tons of iron a day. The company has 11 stacks, including those at Birmingham, Ala., with a capacity of about 5000 tons a day.

The Elyria Steel Products Co., Elyria, Ohio, is installing machinery in its new plant for the manufacture of steel underframes for automobiles and motor trucks, and in addition is putting in machinery to do all kinds of pressed steel work.

Loose leaf notes on broaching machines and broaching practice have been collated by the J. N. LaPointe Co., New London, Conn., which will send free copies on request. Because of the extensive use of broaching machines in the shops of Detroit and the surrounding territory, this company has opened a branch office at 11 Harper Avenue, Detroit, in connection with which a stockroom and repair shop is maintained as well as a warehouse in which is carried a stock of J. N. LaPointe Co. broaching machines. This Detroit branch is in charge of William L. Nicholls.



# Machinery Markets and News of the Works

## INQUIRIES FALL OFF

### Business in Machine Tools, However, Continues Good

#### Railroads More Conspicuous as Possible Buyers —Boston Textile Interest in Market for Large Lot of Equipment

Some falling off in inquiries and orders is indicated in reports from all leading machine-tool selling centers, but this is not unexpected in view of the extraordinary business that was done in the few months preceding. The present condition could not correctly be characterized as a slump, however, as business on the whole continues very good.

One large project now before the trade has to do with the requirements of the Saco-Lowell Shops, Boston, which are in the market for about \$1,500,000 worth of new equipment. After this is purchased the concern will have about \$1,000,000 worth of used tools for disposal. The New England territory is fairly active, the companies which are buying or figuring on buying covering a variety of industries.

## New York

NEW YORK, Feb. 17.

There has been an unmistakable falling off in inquiries and orders for machine tools in the past week. This is ascribed by some in the trade to the demoralization resulting from the epidemic of influenza and the tie-up of transportation due to recent snow storms rather than to any hesitancy due to financial or economic uncertainty. With some dealers and factory representatives, February business has been good, but this is not the general observation.

Price advances continue. Some manufacturers of radial drills announced last week an advance of about 12½ per cent, effective Feb. 15.

Much of the current business consists of small lots or single machines, aside from continuation of buying on lists which have recently been reported. The Elsemann Magneto Co., Brooklyn, has begun placing of orders on a fair-sized list. The New York Central has recently placed an order with a dealer for a number of tools. A list has come East from the Holt Mfg. Co., Peoria, Ill., for about 20 small tools, principally turret lathes, screw machines, drills, etc., new or used, which are wanted for early delivery.

Bedstead plant and sheet-metal machinery will be purchased by F. N. Simpson, director A. Simpson & Son, Ltd., Adelaide, South Australia, who is about to visit the United States. This company manufactures bedsteads and is reported one of the largest manufacturers of tin ware and enameled hollow ware in Australia. He will leave that country in January and during February may be reached care of the Bank of Adelaide, Leadenhall Street, London, England.

A number of crane manufacturers say that they have received as many inquiries during the past month as in any similar period during the war. One inquiry of good size is from the J. G. White Engineering Co., New York, for the Solvay Process Co., Syracuse, N. Y., and includes four 25-ton and one 35-ton overhead traveling cranes. The New England Structural Steel Co., Everett, Mass., will probably close this week for a 25-ton overhead traveling crane. The Hainesport Mining & Transportation Co., Philadelphia, has purchased a 35-ton locomotive crane. The Nevada Consolidated Copper Co., New York, has purchased a 40-ton overhead traveling crane; and the Tennessee Copper Co. a 10-ton overhead traveling crane through the Pratt Engineering & Machine Co., New York. The American Smelting & Refining Co., New York, has purchased a 15-ton, 36-ft. span overhead traveling crane from the Pawling & Harnischfeger Co.

Railroad inquiry is becoming more conspicuous. The Nickel Plate Railroad is in the market for 28 tools, and the list is being figured on at Cleveland and Cincinnati. The Pennsylvania Railroad has bought a number of machines for its Ohio shops.

Automobile plant expansion continues to be a factor in the Central West. At Cleveland the Grant Motor Car Co. and the Jordan Motor Car Co. are in the market for fair-sized lots of tools, and the Eaton Axle Co. has begun making purchases for its new Cleveland plant.

The Trailmobile Co., Oakley, Cincinnati, has bought tools for its new plant.

The Samson Tractor Co., Janesville, Wis., continues a heavy buyer in Chicago.

The New York market shows less activity, the principal new inquiry coming from the Eisemann Magneto Co., Brooklyn, which will buy a fair-sized list.

The crane market is in a healthy condition. Inquiries in the past month, it is stated, have been as numerous as during any month in the war period. This is a good indication of expansion of manufacturing facilities, sales having been made to companies making products ranging from shoes to automobiles.

The Shepard Electric Crane & Hoist Co. has recently received orders for the following overhead traveling cranes: the Jarecki Chemical Co., Cincinnati, one 11-ton, 80-ft. span, purchased by the Pratt Engineering & Machine Co., New York; the Hedden Iron Construction Co., South Elizabeth, N. J., one 10-ton, 60-ft. span; the Endicott-Johnson Co., Endicott, N. Y., one 10-ton, 57-ft. 6-in. span; the Atlantic Steel Co., Atlanta, Ga., one 5-ton, 68-ft. span; the Elmira Foundry Co., Elmira, N. Y., one 5-ton, 55-ft. span; the Murray Co., Atlanta, Ga., one 7½-ton, 37-ft. 7½-in. span; the Hudson Motor Car Co., Detroit, a 3-ton and a 1-ton crane; W. H. Butterworth & Sons, Philadelphia, a 3-ton, 36-ft. span transfer crane and the Colby Steel & Engineering Co., Seattle, Wash., a 5-ton, 80-ft. span transfer crane.

The New Jersey Power & Light Co. is constructing an additional 2300-volt electric power line to take care of 400 hp. additional power for the Dover Boiler Works, Dover, N. J.

The New York Edison Co., Irving Place and Fifteenth Street, New York, has had plans prepared for a new electric plant at 421-31 East Sixth Street, to cost \$300,000, including equipment.

The Remington Typewriter Co., 374 Broadway, New York, has acquired the plant of the Nathan Mfg. Co., Flushing, Long Island, N. Y., manufacturer of lubricating devices for air compressors and power station equipment, valued at \$1,500,000. The plant consists of four main buildings, aggregating about 200,000 sq. ft., with 15 acres of land, fronting on Flushing Creek. The new owner will take possession about May 1, and proposes to construct extensions to about double the floor area. The plant will be used for the manufacture of typewriters and parts, and it is understood that the removal of the present plant at Bridgeport, Conn., to this location is planned. The Nathan Mfg. Co. will remove its Flushing works to its plant at 416 East 106th Street, New York.

The property and assets of the Fulton Motor Truck Co., Farmingdale, N. Y., will be sold by John S. Sheppard, permanent receiver, 309 Broadway, New York, on March 11. The company was recently adjudged bankrupt by creditors.

The Baehr Body Corporation, New York, has been incorporated with a capital stock of \$1,000,000 under Delaware laws by Thomas R. Hart, Jr., Joseph D. Freckenthal, and Arnold R. Boyd, 37 Wall Street, to manufacture automobile bodies.

The Lozier Motor Co., Plattsburgh, N. Y., is planning for the sale of its local plant, comprising a number of one-story brick and steel buildings, on site totaling about 27 acres.

The New York Central Railroad, Grand Central Terminal, New York, has filed plans for a one-story shop at its Mott Haven yards, to cost about \$5,000.

The Republic Heater & Range Co., New York, has been incorporated with a capital stock of \$50,000 by H. I. Luftmas, J. H. Malloy and E. A. Luthy, 1107 Broadway, to manufacture ranges, boilers, heaters, etc.

The General Motors Corporation, 29 West Forty-second Street, New York, has acquired a tract of property comprising about 61 acres at Minnesink Park, near Red Bank, N. J., formerly used as a county fair grounds. The property will be used in connection with Eastern plant expansion of the company in the line of tractors and motorized farm machinery. It is reported that the erection of an assembling works on the site is being considered.

Electric-operated wood-working machinery, mechanical conveyor system and other equipment will be installed in the three-story plant to be erected by Clark & Co., 154 Rose Street, Newark, N. J., at Rose Street and Jelliff Avenue. The main factory, 55 x 170 ft., will be supplemented by a boiler and engine plant for works service. The project will cost about \$100,000.

The Independent Lamp & Wire Co., 1733 Broadway, New York, is having plans prepared for a new plant on Runyon Street, near Hillside Avenue.

The Brown Mfg. Co., Newark, N. J., has been incorporated with a capital stock of \$50,000 by James Howard, John Stevens and William Brown, to manufacture tools and machinery.

The Steel Barrel Co. of America, Lister Avenue, Newark, N. J., has increased its capital stock from \$50,000 to \$125,000.

A new wire and metal works will be established by the Dressmakers' Supply Co., Newark, N. J., manufacturer of wire dress forms, fixtures, etc., in the two-story factory at 70-72 Marshall Street, which it has just leased.

The Welding Spring Co., 368 Halsey Street, Newark, N. J., has filed notice of organization to manufacture springs, etc. Alvin Hagan heads the company.

The Universal Tobacco Machine Co., 98 Murray Street, Newark, N. J., has had plans prepared for a two-story brick plant, 100 x 200 ft., at Mount Pleasant Avenue and Gouverneur Street, to cost \$115,000, including equipment.

The new plant of the Murray Motor Car Co., Niagara Building, Newark, N. J., formerly of Pittsburgh, will comprise a series of six one-story buildings on Frelinghuysen Avenue, Newark. The company has acquired a tract of land, 408 x 650 ft., and has completed plans for the first plant unit of brick and steel, costing about \$100,000. Five similar buildings will be erected later. The equipment formerly used at Pittsburgh is being stored in New York, and it is expected to have the first unit ready for machinery installation early in May, with such additional equipment as may be necessary. The company will manufacture an eight-cylinder automobile.

The Cutlery Specialty Co., Newark, N. J., has been incorporated with a capital of \$100,000 by E. Philip, R. Tuchman and R. E. Mead, with registered office at 127 Sussex Street, to manufacture cutlery products.

The Smith Rubber & Tire Co., 665 Newark Avenue, Jersey City, N. J., has increased its capital stock from \$1,000,000 to \$10,000,000. It has commenced the erection of a plant in the vicinity of Passaic, N. J., to have an initial capacity of about 600 tires per day. John H. McGuire, Passaic, is president.

The Stirrup Mfg. Co., 257 Greenwich Street, New York, manufacturer of sheet-metal products, has acquired the factory of John Sturm & Son, 397-403 Market Street, Newark, N. J., consisting of a five-story and one-story building, aggregating about 50,000 sq. ft. of space, for a local plant. The Sturm company, manufacturer of automobile bodies, will remove its works to a three-story building at 32-34 Commercial Street.

The William M. Crane Co., Garfield Avenue, Jersey City, N. J., manufacturer of gas-operated heating and cooking equipment, is having plans prepared for two foundry buildings to cost about \$200,000, including equipment.

The Aetna Machinery Co., 25 Church Street, New York, a New Jersey corporation, has increased its capital stock from \$25,000 to \$100,000.

The boiler plant, engine room, and considerable planing-mill machinery at the plant of the Anderson Lumber Co., Wallington, near Passaic, N. J., were destroyed by fire, Jan. 29, with loss estimated at \$150,000.

The Board of Public Works, South River, N. J., is having plans prepared for a one-story power plant, 55 x 95 ft., for borough service, to cost \$125,000. Goss, Bryce & Johnson, 55 Liberty Street, New York, are the engineers.

The Perfect Window Regulator Co., 415 Greenpoint Avenue, Long Island City, N. Y., has acquired a building at the corner of Van Alst and Harris avenues for a new plant.

The Pattern Foundry & Equipment Corporation, New York, has been incorporated with a capital stock of \$10,000 by S. H. Selig, J. Sachs and A. L. Ross, 665 West 160th Street, to manufacture tools, drills, etc.

The Dobbs Metallic Corporation, New York, has been incorporated with a capital of \$75,000 by M. Grossman and W. A. Weir, 249 Madison Avenue, to manufacture hardware, etc.

The Bally Electrical Supply Co., 18 Warren Street, New York, has leased a six-story building at 268-70 Canal Street for a new works.

Haefner Brothers, 75 Fourth Street, Brooklyn, machinists, will build a two-story, brick machine shop, 52 x 100 ft., at Fourth and Hoyt streets, to cost \$20,000.

The Miles Sharpener Corporation, New York, has been incorporated with a capital stock of \$50,000 by M. R. Bracewell, J. and E. Ennison, 1746 West Tenth Street, Brooklyn, to manufacture metal sharpening devices.

The Douglas Iron Works, Brooklyn, has been incorporated with a capital stock of \$20,000 by H. Chernin, J. Krassny and B. B. Tullin, 1725 Sterling Place.

The Yale Piston Ring Co., 560 West Thirty-sixth Street, New York, is planning for the installation of new equipment.

The Garford Motor Truck Co., 427 West Forty-second Street, New York, has acquired, through an affiliated interest, an entire block of property fronting on the Plaza, between Crescent and William streets, Long Island City, for a new service building. Plans are under way for a twelve-story structure, 170 x 200 ft., estimated to cost over \$800,000.

The All-Metal Valve Co., New York, has been incorporated with a capital stock of \$200,000 by D. L. Fultz, I. A. Welch and F. W. Murphy, 630 Mansfield Place, Brooklyn, to manufacture power station specialties.

The Todd Shipyards Corporation, 15 Whitehall Street, New York, has completed plans for a one-story mechanical shop, 80 x 126 ft., at its Brooklyn plant, Van Brunt and Beards street, to cost \$35,000.

The new addition to the plant of the De Laval Separator Co., 165 Broadway, New York, at Poughkeepsie, N. Y., will be one-story, 150 x 150 ft., to be equipped for general machine work.

The M. McTigue Co., New York, has been incorporated with a capital stock of \$100,000 by M. McTigue, P. A. Talbot and J. R. Taylor, 260 West Fifty-seventh Street, to manufacture motors, engines, etc.

The Le Bash Garage Co., 30 East Forty-second Street, Jacob Bashim, president, has filed plans for a one-story service and repair works, 100 x 185 ft., at Whitlock Avenue and 156th Street, to cost \$30,000.

Maldsof & Ashton, Troy, N. Y., have been incorporated with a capital stock of \$15,000 by H. M. Ashton, J. E. McNary and J. L. Maldsof, to manufacture iron and steel castings, foundry products, etc.

The Wolfer Iron & Steel Corporation, New York, has been incorporated with a capital stock of \$25,000 by C. Wolfer, D. M. Bluestone and M. Yockers, 1 Madison Avenue, to manufacture specialties.

The Mica Insulator Co., 68 Church Street, New York, is having plans prepared by W. L. Stoddart, architect, 9 East Fortieth Street, for a three-story addition to its plant at Schenectady, N. Y., to cost \$150,000 including equipment.

## Philadelphia

PHILADELPHIA, Feb. 16.

The Standard Crown Co., Hope and Palmer streets, Philadelphia, manufacturer of bottle seals, stoppers, etc., is having plans prepared for a one-story addition, 62 x 200 ft., with wing 16 x 20 ft., to cost \$35,000.

The L. H. Gilmer Co., Cottman and Keystone streets, Philadelphia, manufacturer of power belting, will build a one-story plant addition at North Wales, 75 x 100 ft., to cost \$25,000.

A one-story brick and concrete power plant and engine house, 36 x 90 ft., will be erected at the works of Charles E. Dearnley, Bayton and Chelton avenues, Philadelphia.

The Fahnestock Mfg. Co., Avonmore, Pa., manufacturer of steel castings, etc., will build a one-story foundry addition, 130 x 140 ft., to cost \$25,000.

Parrish & Read, Inc., Camden, N. J., have been incorporated with a capital stock of \$100,000 by R. W. Read, Collingswood, N. J.; A. W. Parrish, Frankford, Pa., and T.



H. Read, Philadelphia, to manufacture engineering instruments and other precision apparatus.

Fitzgibbon & Crisp, Inc., Calhoun and Durnham streets, Trenton, N. J., manufacturer of automobile bodies, is planning for a one-story brick and steel addition, 60 x 150 ft., to cost \$18,000.

Sotter Brothers, Inc., Pottstown, Pa., manufacturer of boilers, tanks, etc., has awarded a contract to the McClintic-Marshall Co., Pittsburgh, for a four-story brick and reinforced-concrete plant addition, 60 x 120 ft., to cost \$100,000.

Plans are being considered by the Pennsylvania Paper Co., Lock Haven, Pa., for a new three-story mill, 100 x 300 ft., to cost in excess of \$2,000,000 with machinery. It will develop a capacity of 120 tons a day.

The Battery Parts Co., Wilkinsburg, Pa., has been incorporated in Delaware with a capital stock of \$100,000 by O. E. Brashear, Mortimer Evans and W. H. Williams to manufacture mechanical and electrical equipment.

The Keasbey & Mattison Co., Ambler, Pa., manufacturer of asbestos products, is having plans prepared for a two-story addition.

Industrial statistics compiled by the city officials, Reading, Pa., show an increase in iron working plants, mills and factories from \$59,000,000 in valuation in 1914 to \$200,000,000 at the present time.

The Allen Tire & Rubber Co., 510 Hamilton Street, Allentown, Pa., has acquired local property in the Bachman Terrace section and plans for the erection of a plant for the manufacture of tires and rubber products. Wilmer Dunbar is president.

The Atlas Engineering Co., Philadelphia, has been organized with a capital stock of \$15,000 by William P. Schmid, 6252 Addison Street, Philadelphia, treasurer; William F. Thornton, 257 Hataway Road, Wynnewood, Pa., and Thomas F. Beirre, 6225 Limekiln Road, Philadelphia, to manufacture machinery.

The Luster Machinery Co., Philadelphia, has been incorporated by Henry G. Hodges, 130 West Spring Street, Reading, Pa.; Fred G. Hodges, 708 Centre Avenue, Reading, and Emile J. Luster, Norristown, Pa., with a capital stock of \$50,000 to manufacture machinery, tools and railroad equipment.

The Perseverance Iron Foundry, Inc., Philadelphia, has been chartered with a capital stock of \$40,000 by Percy L. Lanning, Elkins Park, Pa., treasurer; Clarence B. Lanning, 5337 Wynnefield Avenue, and Heber S. Lanning, 4933 Morris Street, Philadelphia.

The Mont-Clare Foundry Co., Philadelphia, capitalized at \$50,000, has been incorporated by Clare M. Borton, 114 Park Row, Llanerch, treasurer; Horace E. Frick, 806 South Forty-ninth Street, and Randolph Sailer, 929 Chestnut Street, Philadelphia.

The Atlantic Elevator Co., Philadelphia, capitalized at \$5,000, has been incorporated to manufacture elevators, hoisting machinery, etc. William F. Mechling, Pelham Court Hotel, Philadelphia, is treasurer.

## New England

Boston, Feb. 16.

Although weather conditions have been decidedly adverse for business the past week, the demand for machine tools has been remarkably good. One local machine representative in the first ten days of February sold more tools than in any two months during the war, and virtually every other house reports sales running well in excess of those for the corresponding period last year. As heretofore, the bulk of the buying is for single or two or three machines, but the aggregate value is most gratifying. Even the Portland, Me., manufacturers, who usually are not conspicuous factors in this market, are placing orders for numerous tools. Railroad freight embargoes have aggravated the delivery situation. It not only has been impossible to get new tools into New England, but to move second-hand equipment within its borders.

Further advances in prices are recorded. A Cincinnati manufacturer has marked up lathes 15 per cent, radial drills 12½ per cent, planing machines 7 per cent and shapers from 10 to 20 per cent. Other concerns are asking 15 per cent more for milling machines, and screw tool equipment has advanced as much. A large Rhode Island company has raised its price on surface grinders \$75 each. Automatic drills have gone up 10 to 15 per cent and in some cases a little more. The tendency of quotations on small tools also is upward. The past week there has been a general advance in taps which, on some numbers, runs as high as 25 per cent. Dies have been marked up 20 per cent on the average. It is reported that the leading makers of hack saws are to revise their lists upward. During the past month or two the Government has offered in this market a large number of stand-

ard makes of tools at prices ranging from 15 to 25 per cent under market quotations. These have been absorbed by consumers so that the market to-day probably is supplied with fewer offerings than ever before.

In the machine tool market the outstanding feature is centered in the Saco-Lowell Shops list, involving \$1,500,000, representing the 1920 needs of its three plants, and which is being handled by W. H. Savage, Fitchburg, Mass., instead of C. R. Brown, purchasing agent, 77 Franklin Street, Boston. The list contains 28 shapers and other tools in proportion. Most of the lathes needed have been bought. This list means that virtually \$1,000,000 worth of second-hand tools will come on the market. The General Electric Co., Lynn, has not progressed very fast with its 1920 list. It bought some tools the past week, however, but most of them applied to old inquiries, the effort being made to clean up on these before starting anew. The 1920 list contains many individual tools, for instance, 21 lathes of one type in it. The United Shoe Machinery Corporation's activities are confined to small tools, but the management is going over its large tool equipment to ascertain what is needed. Nothing new has developed regarding the Worthington Pump & Machinery Corporation's list. Hudson, Mass., interests are making inquiries on a considerable amount of equipment, and the Walworth Mfg. Co., Boston, on a small amount. The Crowfoot Gear Works, Inc., Cambridge, Mass., has not covered its requirements for the new Hyde Park plant. The Lebanon Machine Works, Lebanon, N. H., manufacturer of auger bits, road signs, etc., is in the market for a lathe and shaper, and the Frank F. Davis Co., 175 Richdale Avenue, Cambridge, rebuilt paper mill machinery, wants a 26-in. swing lathe with an 18-ft. bed, as well as a shaper for general machine work. The Lamson Co., Boston, recently bought equipment and is inquiring for additional tools. A Boston newspaper is negotiating for a fair amount of machine shop equipment. The Boston & Maine Railroad is working on a 1920 budget.

The Boston & Albany Railroad recently bought some pipe machines, but these did not apply to its 1920 budget, which is expected to be acted upon within a short time. The Newport Navy Yard, Newport, R. I., bought some equipment against its new list, and the Worcester Machine Works, Inc., and the M. S. Wright Co., Worcester, Mass., figured in a small way in recent transactions. The Norton Co., Worcester, purchased two shapers, and the Amoskeag Mfg. Co., Manchester, N. H., a lathe. The latter company for some time has contemplated buying heavily, but the project has been abandoned. The Stroms Drop Forging Co., Springfield, Mass., just closed for a number of second-hand lathes, shapers, dies and sinkers, mostly with Philadelphia dealers, and in addition has bought a new hammer and other equipment, and is now well covered. The Fess Rotary Oil Burner, Inc., Boston, placed local orders for six lathes and some hand-screw machines. The Locomobile Co., Bridgeport, Conn., purchased several large special tools, and the Wickersham Quoin Co., Boston, production equipment for a new developed process of manufacture of printers' rulers.

There are more active crane inquiries in the local market than in several months. The Sullivan Machinery Co., Claremont, N. H., the New England Structural Co., Everett, Mass., and the Winnisimmet Ship Yard, Inc., Chelsea, have each bought a crane. A Vermont marble concern purchased several and will need more later. The Walworth Mfg. Co., Boston, has a large list of cranes for its New York warehouse. Stone & Webster are covered on some cranes, but still open on those wanted for Long Island and Lowell, Mass., projects.

Chucks continue in excellent demand. A Great Barrington, Mass., concern recently placed a sizable order for Levele air chucks.

No date has been set for the closing of bids on the new \$400,000 Westinghouse Electric & Mfg. Co.'s machine shop at East Springfield, Mass.

Contract has been let for the erection of a two-story building, 55 x 85 ft., for the Danbury Falls & Roller Bearing Co., Danbury, Conn.

Plans are being prepared for a one-story addition, 37 x 110 ft., to the plant of O. B. North Co., New Haven, Conn., manufacturer of buckles, castings, etc.

It is expected Vedoe Peterson will award a contract for the construction of a one-story machine shop, 50 x 117 ft., at Norfolk Downs, Quincy, Mass., within a few days.

As soon as weather conditions permit work on the two-story addition, 80 x 200 ft., to the J. R. Montgomery Co., Windsor Locks, Conn., will begin. It makes metal threads, etc.

The American Specialties Co., Bridgeport, Conn., hardware specialties, will soon award contract for the construction of a two-story, 50 x 100 ft. addition.

Officials of the Bridgeport Castings Co., Bridgeport, Conn., whose plant recently was destroyed by fire with a loss of \$75,000, state that work on a new factory will start at once.

The general and sub-contracts for the one-story addition 50 x 100 ft., to the wire mill has been let by the Bridgeport Screw Co., Bridgeport, Conn.

The Crane Co., Bridgeport, Conn., chains, will soon begin work on a three-story plant, 501 x 111 ft., to cost \$460,000. The equipment is expected to bring the cost up to \$500,000.

Smith & Wesson, Springfield, Mass., have purchased 25 acres on Bay Street. The proposed plans for Dwight Street extension leave no chance for the company to expand.

As soon as the weather permits ground will be broken by the Worcester Wire Works, Inc., Worcester, Mass., for the erection of a two-story addition to cost \$35,000. It will be of concrete and contain about 40,000 sq. ft. of floor space.

The Danbury Foundry, Inc., Danbury, Conn., has been incorporated with a capital stock of \$25,000 by E. and R. J. Hausin and W. H. Cable, 248 Main Street, to manufacture iron and steel castings.

The addition to be erected by the David Thurber Machine Co., North Andover, Mass., will consist of a four-story, brick and reinforced-concrete structure, 60 x 120 ft., to cost about \$140,000.

The American Wringer Co., Social Street, Woonsocket, R. I., will build a one-story addition, 40 x 65 ft., to cost \$12,000.

The Phoenix Brass Foundry Co., Hartford, Conn., has filed notice of dissolution.

The American & British Mfg. Corporation, Bridgeport, Conn., has arranged with the Bear Tractor Corporation, New York, to give over a department of its local plant to the production of four-plow tractors of Bear type. The contract covers the entire proposed output for a period of time.

The Manross-Robertson Co., New Britain, Conn., has been incorporated with a capital of \$50,000 by F. N. Manross, 69 Central Street, Forestville; A. N. Manross, Washington Street, Forestville; and C. F. Robertson, 74 Hamilton Street, New Britain, to manufacture hardware specialties.

The Acme Wire Co., New Haven, Conn., has increased its capital from \$1,500,000 to \$3,000,000.

The City Building Commission, Hartford, Conn., is planning for the erection of a one-story machine shop for municipal service to cost about \$60,000.

The Liberty Mfg. Co., New Haven, Conn., has been incorporated with a capital stock of \$50,000 by Alexander Parda, 72 Grove Street, New Britain, and associates, to manufacture heating appliances.

The Bridgeport Gun Tool Co., Bridgeport, Conn., has filed notice of dissolution.

The Mirete Metal Co., Springfield, Mass., has been incorporated with a capital stock of \$10,000 by Thomas W. Burden, George C. Raymond, Jr., and H. A. Bryant, to manufacture metal products.

The Russell & Erwin Mfg. Co., New Britain, Conn., a branch of the American Hardware Corporation, is having plans prepared by Philip Sellers, engineer, 307 Orange Street, New Haven, for the construction of an addition.

## Buffalo

BUFFALO, Feb. 16.

The O'Neil Iron Works, Perry and Chicago streets, Buffalo, has been acquired by local interests. The O'Neil company was organized in 1917 by John F. O'Neil, St. Louis, Mo., and associates, and the plant was formerly operated under the name of the Lake Erie Engineering Works. The new owners will continue operations as heretofore for the manufacture of sugar-cane machinery, etc., being headed by John M. Hull, president; W. D. O'Neil, vice-president and sales manager; and Walter V. Houck, vice-president and general manager.

The Sinclair Mfg. Corporation, Buffalo, has been incorporated with a capital stock of \$50,000 by L. L. Sinclair, L. A. Hallstead and J. L. Kennefick, to manufacture engines and power machinery.

The Buffalo Porcelain & Enameling Co., Buffalo, is planning for a two-story plant at 1927 Elmwood Avenue, to cost \$25,000.

Public utility companies in northern New York have made application to the Public Service Commission, Albany, for permission to enlarge their plants as follows: The Syracuse Lighting Co., South Warren Street, Syracuse, to issue notes for \$500,000; the Iroquois Utilities Co., City Bank Building, Syracuse, to build an addition to its electric generating plant; the Western New York Utilities Co., Medina, to build a new electric power plant at Clarendon, Orleans County; the Niagara & Erie Power Co., Marine Bank Building, Buffalo, to build a new electric generating

plant and high-tension transmission system to cost \$370,000; the Portville & Cattaraugus County Utilities Co., Portville, to construct a new electric power plant.

The Niagara Brass Corporation, Lockport, N. Y., has been incorporated with an active capital of \$52,500 by J. H. Baer, A. Dodge and W. G. Lang, to manufacture brass and bronze products.

The Continental Heater Co., Dunkirk, N. Y., has increased its capital stock from \$150,000 to \$250,000. It will build a one-story foundry addition on Otter Street, 64 x 175 ft., to cost \$25,000.

The Hayes Mfg. Co., Twelfth and Liberty Streets, Erie, Pa., manufacturer of metal products, will build a two-story, brick and steel forge shop addition to cost about \$70,000.

The Ferguson Steel & Iron Co., Bailey Street, Buffalo, has had plans prepared for a one-story steel building, 50 x 150 ft., at 104 Leslie Street.

The Syracuse Metal Products Corporation, Syracuse, N. Y., has been incorporated with an active capital of \$55,000 by C. P. McArthur, A. J. Hemmer and L. E. Doyle.

The Rochester Aircraft Corporation, Rochester, N. Y., has increased its capital stock from \$30,000 to \$250,000.

The Tompkins Brothers Co., 583 South Clinton Street, Syracuse, N. Y., manufacturer of textile and knitting machinery, has arranged for the immediate construction of a one-story addition 72 x 285 ft., with L-shaped extension, 40 x 120 ft., on Oneida Street, to cost about \$35,000.

The new plant to be erected by the Sargent & Greenleaf Co., 178 Court Street, Rochester, N. Y., manufacturer of locks and hardware, will be one story, 24 x 185 ft., with two-story extension, 40 x 214 ft. It will be located on Norton Street, and with equipment is estimated to cost about \$200,000. A new corporation has recently been formed to operate the company, taking over the holdings of Halbert S. Greenleaf and James Sargent, both deceased.

The Starter & Ignition Service Co., Rochester, N. Y., will build a one-story works building, 50 x 150 ft., at 18-20 North Union Street, to cost \$30,000.

The Duesenberg Motors Corporation, Rochester, N. Y., headed by Fred and Otto Duesenberg, is planning for a new plant at Cleveland, Ohio, for the manufacture of motors. A new company will be formed to be known as the Duesenberg Automobile & Motor Corporation, capitalized at \$15,000,000, with company officials including the two men noted and L. M. Rankin, president Highlander Motor Corporation, Kansas City, Mo., and Newton Van Zant, president Revere Automobile Co., Logansport, Ind. Options have been taken on a site at Cleveland and plans are under way for the proposed plant.

Contract for 2000 Rochester-Duesenberg automobile motors has been obtained by the Rochester Motor Co., Rochester, to be executed before Aug. 1, and the number is to be doubled during 1921. A large addition to the company's plant in Lexington is contemplated to facilitate the work. Fred C. Kimmel is president.

The Northwest Foundries, Inc., Villa and Valentine streets, Rochester, have prepared plans for a new two-story gray-iron foundry building, 197 x 250 ft., at Villa and Valentine streets. It will contain 56,000 sq. ft. on each floor. George A. Hetzler is secretary and general manager.

The Rome Wire Co., Rome, N. Y., manufacturer of bare and insulated electrical wires, which recently increased its capital from \$1,500,000 to \$10,000,000, has purchased the copper wire-drawing and rubber insulating departments of the B. F. Goodrich Co., Akron, Ohio, and intends to move them to its new plant at Buffalo, formerly the Carrick works. The Buffalo branch will manufacture for its own consumption, bare copper wire from which it will manufacture rubber covered wires and cables, particularly for use in the automobile trade. H. T. Dyett, is president.

The Niagara Pattern & Model Works, Buffalo, Paul C. Wobrock president, is taking bids for a pattern shop and manufacturing building, 66 x 82 ft., two stories, at Niagara Street and Delavan Avenue, of brick and steel, to cost \$25,000.

The petition of the Western New York Utilities Co., Medina, N. Y., for the construction of an electric lighting plant at Clarendon, N. Y., has been approved by the New York State Public Service Commission.

The Beebe Island Syndicate, Watertown, N. Y., is having plans prepared for a hydroelectric plant on Beebe Island near Watertown, by the J. G. White Engineering Corporation, 37 Exchange Place, New York. It will be of steel, brick and concrete, to cost \$1,000,000.

Industrial interests at Watertown, N. Y., are planning the construction of a hydro-electric power plant near Sewalls Island for local industrial service. Among those interested



are the International Paper Co. and the Hinde & Dauch Paper Co.

The Bagley & Sewall Co., Watertown, N. Y., manufacturer of paper-mill machinery, castings, etc., has acquired property on East Moulton Street, as a site for a new branch plant.

## Pittsburgh

PITTSBURGH, Feb. 16.

The Wheeling Machine & Welding Co., Twentieth and Main streets, Wheeling, W. Va., has changed its name to the Wheeling Machine Products Co. It is now making arrangements to expand its business by building a department to be devoted entirely to the making of general screw machine products, such as cap screws, cylinder and mold studs, ring posts, etc. The company is desirous of receiving bids for all machinery necessary in equipping such a department.

The Pittsburgh Conveying Machinery Co., Duquesne Way, Pittsburgh, is planning for the installation of a number of new machine tools, including radial drill, drill press, lathe, etc.

Samuel Peterson, Inc., Warren, Pa., has been incorporated with a capital stock of \$200,000 by Samuel Peterson and associates to manufacture tools, machine parts, etc.

The Penn Public Service Co., Johnstown, Pa., has arranged for a bond issue of \$4,000,000 in connection with an increase in its power generating facilities. At its Rockwood plant the company will increase the output by about 5000 kw. A subsidiary company has been organized to acquire a tract of land near Seward, Pa., about 12 miles from Johnstown, and a new plant, with ultimate capacity of 80,000 kw., will be established at this site; the initial output of this power station will be 30,000 kw., with balance added as rapidly as possible.

Fire, Feb. 5, destroyed a portion of the plant of the Hydroxiline Gas & Equipment Co., Eighth Avenue, West Homestead, Pa., with loss estimated at about \$35,000. S. W. Downey is president.

The Adams Brothers Mfg. Co., Chateau and Fayette streets, Pittsburgh, manufacturer of stoves, heaters, ranges, etc., has acquired buildings at Fayette Street and Chartiers Avenue, on site 48 x 105 ft., for a branch works.

Horst & Mooney, Pittsburgh, have filed plans for a two-story automobile service and repair works, 61 x 120 ft., at California Avenue and Rankin Street, to cost \$39,000.

The American Armature & Machine Co., Mullens, W. Va., is having plans prepared for a one-story and basement plant, 30 x 100 ft.

The Central Foundry & Equipment Co., Charleston, W. Va., recently incorporated with a capital stock of \$500,000, has acquired considerable property formerly used by the Government at Nitro, W. Va., including machine shops and other mechanical buildings. The company will establish a works for the manufacture of foundry equipment, including ladles, trucks, cranes, elevators, etc., and will give employment to about 250 persons for initial operations. It is planned to commence operations within a month. John S. Ball, Columbus, Ohio, is president.

The Fairmont Motor Car Co., Fairmont, W. Va., recently organized with a capital of \$50,000, is perfecting plans for an automobile service and repair works. The latter department will be provided with lathes, planer, drill, grinders, etc. R. M. Morgan is president and manager, and L. B. Morgan, secretary and treasurer.

The Kentucky & West Virginia Power Co., Logan, W. Va., will build an addition to its local power plant to cost about \$150,000.

William H. Hervey, Wheeling, W. Va., is at the head of a project to establish a plant in the vicinity of Wheeling for the manufacture of airplanes and parts.

The American Armature & Engineering Co., Matoaka, W. Va., is planning for the establishment of a new local plant for the manufacture of electrical and mechanical products. J. Lee Barley is president.

The Guyan Machine Works, Logan, W. Va., will receive prices on lathes.

Prices on lathes, drills, presses, planers, etc., are invited by the Fairmont Motor Car Co., Fairmont, W. Va.

The Emporium Pipe & Foundry Works, Emporium, Pa., capitalized at \$75,000, has been incorporated by C. J. Good-nough, C. W. Rishell and Josiah Howard to manufacture iron and other metal castings, etc. John Schwab is treasurer.

The Erie Equipment Co., Johnstown, Pa., has been incorporated to manufacture electrical and mechanical appli-

ances. The capital stock is \$25,000. Howard A. Selah, treasurer, and Stephen A. George are the incorporators.

The Crawford Iron & Mining Co., Pittsburgh, capitalized at \$50,000, has been organized to manufacture iron and steel or both. R. T. Rossell, 747 Union Arcade, Pittsburgh, is treasurer. The incorporators, all of Pittsburgh, are L. R. Martin, E. C. McHugh and F. J. Young.

The Standard Die, Stamping & Mfg. Co., Pittsburgh, has been incorporated to manufacture machinery, tools, dies, etc., by Charles G. Auchter, treasurer, 919 Madison Avenue, George Auchter, 1344 Frederick Street, and Camillus Auchter, 1401 Adams Street, Pittsburgh. The capital stock is \$30,000.

The American Castings Co., Corry, Pa., capitalized at \$50,000, has been organized to manufacture metal products. S. O. Stewart, Corry, is treasurer.

The Adams Foundry & Machine Co., Youngstown, Ohio, which has been incorporated with a capital stock of \$100,000 by F. G. Friedrich and others to manufacture a non-skid device for automobiles, plans to erect a machine shop.

## Baltimore

BALTIMORE, Feb. 16.

The Baltimore Dry Dock & Shipbuilding Co., Baltimore, has bought the plant of the Pusey & Jones Co., at Gloucester, N. J., formerly the Pennsylvania Shipbuilding Co. and the New Jersey Shipbuilding Co. It was announced by the purchasing company that the plant will be operated and the Baltimore plant will continue in operation as usual. The plant has 11 shipbuilding berths and is fully equipped with cranes, tools, buildings, etc. It comprises about 179 acres and has about 1½ miles of waterfront. Possession of the plant will be taken when the settlement between the Pusey & Jones Co. and the United States Shipping Board is made in regard to the vessels under construction at the plant and other details are completed. It is understood that it is the intention of the Baltimore Dry Dock & Shipbuilding Co., of which Holden A. Evans is president, to increase the work at both plants.

The Maryland Toy Mfg. Co., 512 Equitable Building, Baltimore, has been incorporated with \$50,000 capital stock by Hillard H. Deane, Frank L. Dorsk and Percy Harrison.

R. J. Kearney & Co., Grant and Water streets, Baltimore, will install 300 hp. in motors.

The Cook-Lewis Foundry Co., Greensboro, N. C., has been incorporated with \$50,000 capital stock. Plans are being made to build a plant 40 x 75 ft. A. B. Lewis is manager.

The Elizabeth City Iron Works & Supply Co., Elizabeth City, N. C., is reported planning to build a plant for the construction and repair of steel ships.

The Cummings-Lemacks Machinery Co., Walterboro, S. C., has been incorporated with \$12,000 capital stock. E. L. Lemacks is president, C. T. Cummings, vice-president, and J. C. Lemacks, secretary and treasurer.

Plans are said to be under way by the Chickasaw Shipbuilding & Car Co., Birmingham, Ala., for the construction of a plant for the manufacture of steel cars and frames.

The Burt Machine Co., 401 East Oliver Street, Baltimore, has broken ground for a three-story machine-shop addition, 30 x 40 ft.

The Board of Commissioners, Hagerstown, Md., is planning for a bond issue of \$300,000 for the construction of a new municipal electric light and power plant on Antietam Creek.

As an initial building for its proposed new plant at Fairfield, the Globe Shipbuilding & Dry Dock Co., Fidelity Building, Baltimore, is taking bids for a two-story and basement concrete structure, 55 x 120 ft. B. C. Cooke is president.

Dupont Motors, Inc., has been formed to succeed the Dupont Motor Mfg. Corporation, Wilmington, Del. It has taken over also the assets of the Delaware Marine Motors Co., Commerce Street, Wilmington. At the same time the capitalization has been increased to \$1,500,000, 7 per cent preferred and 30,000 shares common stock, no par value. The officers of the company are: E. Paul du Pont, president, A. M. Maris, vice-president and general manager, Parke Ross, treasurer, and C. B. Bishop, secretary. The company will manufacture the du Pont automobile and also the du Pont marine motor. In connection with the Marine company it is rumored that plans are under consideration for the removal of its plant to another city, with large increased plant capacity. Negotiations are said to be under way for a site in the vicinity of Philadelphia.

The Cyclone Starter & Truck Co., Paris, S. C., has been incorporated with a capital stock of \$1,000,000 by W. L. Huchins, Charles G. Eldson and D. B. Traxler to manufac-

ture motor trucks, automobile starters, etc. Plans are under way for a local plant.

The Atkinson & Long Mfg. Co., 306 Market Street, Newark, N. J., manufacturer of locks, hardware, etc., has leased a building providing about 7500 sq. ft. of space at Petersburg, Va., for a branch plant.

The plant of the Tungsten Products Co., Baltimore and Seventh streets, Highlandtown, Md., including equipment, has been acquired by John D. Roney and Morris Schapiro at a public sale. The new owners are said to be planning to operate the plant for similar production.

The Simmons Co., Kenosha, Wis., manufacturer of brass and metal beds, springs, etc., has awarded a contract to E. L. Bass & Brothers, 708 Bainbridge Street, Richmond, Va., for its proposed two-story plant in that city. The factory will be of reinforced concrete, 100 x 160 ft.

The Shenandoah Valley Milling Co., 418 Equitable Building, Baltimore, with plant at Front Royal, Va., is planning for a hydroelectric power plant for works service, with initial capacity of about 1600 hp. Albert M. Quick is president and chief engineer.

C. C. Coddington, Inc., Charlotte, N. C., is having plans prepared for a six-story reinforced-concrete and steel automobile service and repair works, 90 x 200 ft., to cost \$400,000 including equipment.

The Minuet Change Lever Co., Birmingham, Ala., has been incorporated with a capital stock of \$100,000 by P. L. Mumford and Percy Coplon, to manufacture special levers and controlling devices.

The Ajax Foundry & Machine Co., Anniston, Ala., recently organized with a capital of \$125,000, is planning for a new iron and steel foundry and machine shop. Frank G. Carrington is president.

The Hamner Motor Car Co., Keysville, Va., is planning for a two-story service and repair works, 72 x 200 ft.

The Long Distance Spark Plug Co., Birmingham, Ala., has increased its capital stock from \$10,000 to \$50,000.

## Milwaukee

MILWAUKEE, Feb. 16.

Milling machine manufacturers are becoming more crowded with business, which is mostly for single tool and small lot orders. Other tool builders also are profiting by the demand, the automotive industries being the principal purchasers. Despite embargoes and the most acute car shortage in history, local manufacturers are experiencing relatively less difficulty than might be expected, due largely to the fact that carload business is mainly affected. Crane manufacturers have all the business they can conveniently handle for several months. Structural shops in general are loaded with work requiring capacity operations for three to six months.

The Interstate Drop Forge Co., Milwaukee, which was incorporated in December with a capital stock of \$50,000, has increased the issue to \$250,000 and will break ground about March 1 for its new plant, consisting of a forge shop, 100 x 140 ft., and a machine shop, 75 x 100 ft., on Hopkins Street, near Thirty-second Street. Orders for much of the equipment has been placed. The Northwestern Bridge & Iron Co. is designing the plant and will have charge of the entire construction. Major S. M. McFedries, 624 Shepard Avenue, Milwaukee, is in charge of the new company.

The Meigs-Powell Co. of Milwaukee, a new \$50,000 corporation, has established a plant in the Montgomery Building, Milwaukee and Michigan streets, for the production of high grade mechanical tools, including the Wells caliper. The principals are Arthur E. Meigs and John D. Powell who for many years were branch managers of the L. S. Starrett Co., Athol, Mass., in New York and Chicago, respectively.

The Cleveland Cliffs Iron Co. will erect a new locomotive shop and roundhouse at Hibbing, Minn., and has let contract for the buildings to the Worden-Allen Co., Milwaukee.

The Nash Motors Co., Kenosha, Wis., has acquired a half interest in the W. S. Seaman Co., Milwaukee, manufacturer of automobile bodies, at a price of \$255,000. In addition, the Nash Company is having plans prepared for a body shop at the main works in Kenosha, details of which will be made public in about a week.

The Mechanical Equipment Co., 129 Michigan Street, Milwaukee, has changed its corporate style to the Milwaukee Press & Machine Co.

The South Side Malleable Casting Co., Fourteenth and Windlake avenues, Milwaukee, is making improvements in its foundry. The Lakeside Bridge & Steel Co., Milwaukee, will furnish three 5-ton, hand-operated cranes and a steel runway over the furnaces. Walter W. Lange is secretary and treasurer.

The Milwaukee Electric Crane & Mfg. Co., Milwaukee, has the contract for three 10-ton cranes for the new turbine shop of the Westinghouse Electric & Mfg. Co. at Lester, Pa. A 30-ton crane, with 5-ton auxiliary hoist, and a 70-ft. span, will be furnished to the Hooven, Owens, Rentschler Co., Hamilton, O.

The Bernert Mfg. Co., 489-491 Twelfth Street, Milwaukee, at its annual meeting decided to erect a foundry and machine shop of its own, costing between \$50,000 and \$75,000. It is capitalized at \$1,000,000 and manufactures patented pneumatic grain conveying systems. George Bernert is president and general manager.

The Milwaukee Auto Specialty Co., 711 Chestnut Street, has been reorganized as the Milwaukee Auto Specialty Mfg. Co., with a capital stock of \$25,000. The entire interest has been acquired by Walter R. Fleischer, Walter J. Raley and William J. Schubert, who were associated with the old concern. It will continue the manufacture of metal automotive specialties and parts.

The Valley Iron Works, Appleton, Wis., manufacturer of paper mill equipment, has plans for a foundry addition and an extension to the erecting shop, estimated to cost \$75,000. The plant was enlarged 100 per cent during the war to handle marine engine contracts for the Government. These additional facilities have been outgrown and further expansion is made necessary.

The Farmers Barn Equipment Co., Two Rivers, Wis., will transfer its works and offices to Stevens Point, Wis., where it will occupy an existing building, 43 x 210 ft., two stories, with acreage for future extensions. New equipment is being purchased. Louis H. Sell is president.

The Northern Furniture Co., Fond du Lac, Wis., will take bids about Feb. 28 for additions costing \$135,000 and providing 90,000 sq. ft. of additional floor space. The main unit will be 100 x 100 ft.; boiler house, 52 x 60 ft.; garage and shop, 35 x 70 ft. New boilers, with automatic stokers, will be installed. J. E. Hennen is architect.

The Palmolive Co., Milwaukee, manufacturer of soaps and toilet articles, has purchased a site in Oakland, Cal., for a new coconut oil mill and refinery costing between \$500,000 and \$600,000 and having a daily output of 65 tons of crude oil a day. A six-story addition to the refinery at the main plant in Milwaukee is now under construction. Caleb E. Johnson is president and general manager.

The Auto Specialty Mfg. Co., 418 South Barstow Street, Eau Claire, Wis., has purchased adjacent acreage and will erect a three-story factory and shop addition, 50 x 120 ft. The capital stock has been increased from \$50,000 to \$100,000. C. A. Stuck is president and manager.

The Edgerton Barn Equipment Co., Edgerton, Wis., has increased its capital stock from \$15,000 to \$50,000 and will enlarge its factory. H. C. Schmeling is president.

The Sanitary Refrigerator Co., Fond du Lac, Wis., has increased its capital stock from \$200,000 to \$300,000 to finance enlargement of its plant and equipment during this year.

The Kewaunee Machine Co., Kewaunee, Wis., a new concern, has resumed the operation of the former Marvel Motor Works under the direction of C. R. Johnson and Ralph Waldman, Green Bay, Wis., who with Carl Hartmann are the new owners. A small list of new and used tools is being purchased.

The Board of Education, Two Rivers, Wis., has acquired a site for the proposed new high school building, to be erected at an estimated cost of \$500,000. A vocational training institute will be included in the plans.

The International Earth Boring Machine Co., Chicago, has purchased a site of 17.8 acres at Kenosha, Wis., adjacent to the works of the Winther Motor Truck Co., and will erect a factory, 130 x 280 ft., for making creeper tractors equipped with machinery for setting transmission line poles. The company is capitalized at \$1,000,000. Frances Faltmeyer is president.

The Plymouth Foundry & Machine Co., Plymouth, Wis., which increased its capitalization from \$65,000 to \$130,000, will erect a new foundry unit to eliminate that space used in its present plant, and give additional facilities for an increased output. Plans and specifications have been prepared by Klug & Smith, architects, Milwaukee. Estimates for materials and construction are being received, but no contracts have as yet been let.





Dress Rehearsal in the Plant of the Chesapeake Iron Works, Identical with the Company's Exhibit at the Convention of the American Foundrymen's Association. A Young Woman Operated the Crane, Lowering a Weight so Gently That an Egg, Placed Beneath, Was Merely Cracked

## Cleveland

CLEVELAND, Feb. 16.

The demand for machinery continues very good although some local dealers report a falling off in sales and inquiries. A slackening has been expected as the trade felt that the heavy buying of the past few months could not continue indefinitely. It is also believed that delayed deliveries have had something to do with the easing up in the demand as some buyers try to get along without additional machines when they find it impossible to get deliveries within four months or longer. Some houses have practically no machinery on their floors which is also affecting the volume of business.

With an easing up in demand from industrial companies there has been more activity on the part of the railroads. The Pennsylvania Lines this week purchased a number of machines for its Ohio shops, and the Nickel Plate Railroad, through its purchasing agent in Cleveland, issued a list of 28 machines, including boring mills, turret lathes, drilling machines, bolt cutters, hydraulic press, sheet metal and wood-working machinery and electric welding equipment and generators. A new inquiry has come from the Pennsylvania Lines for a 250-ton erecting crane for its Columbus, Ohio, shops.

A good volume of business continues from the automobile field. The Grant Motor Car Co. and the Jordan Motor Car Co., Cleveland, which are making extensions, are in the market for fair sized lots of machine tools, and the Eaton Axle Co. bought considerable machinery the past week to equip its new Cleveland plant. Orders aggregating about \$40,000 were placed for equipment for a new shop to be opened in Akron to engage in machine work in connection with the tire industry. The Merit Machine Co., 17331 Euclid Avenue, Cleveland, bought some equipment for work on automobile parts. The General Electric Co. purchased several planers and boring machines for its Erie works and the Erie Forge Co. purchased two large planing machines.

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, has issued a list of crane requirements for its new open-hearth steel plant which includes one 100-ton ladle crane with 55-ft. span; one 3½-ton stripping crane; two 10-ton, 60-ft. span cranes; one 3½-ton, 60-ft. span gantry crane; two 10-ton, 90-ft. span yard cranes; one 25-ton, 70-ft. span crane with 5-ton auxiliary, and one 20-ton skull cracking crane and a 5-ton charging machine.

The Demco Machine Tool Co., Frankfort Avenue, Cleveland, has been reorganized and its capital stock increased from \$50,000 to \$100,000. The new officers are A. Reutsch, president and general manager, formerly vice-president; Charles F. Siegrist, vice-president and treasurer, and C. P. Lieblein, secretary and sales manager. Mr. Lieblein was for many years connected with the machinery sales department of the Strong-Carlisle-Hammond Co., Cleveland. The Remco Company contemplates erecting a new plant largely

increasing its capacity. It makes high speed ball bearing drilling machines of the bench and floor types, with single and multiple spindles, and high speed ball bearing drilling, milling and tapping machines.

The Towmotor Co. has established quarters for the manufacture of gasoline tractors for industrial plants in the works formerly occupied by the Craig Tractor Co., Bliss Road, Cleveland. F. W. Sears is president; L. M. Sears, vice-president and general manager, and Ernest McGeorge, secretary.

Plans are being worked out by Cleveland banking interests for the reorganization of the Standard Parts Co., Cleveland. Christian Gird will retire from the presidency and will be succeeded by J. O. Eaton, president Eaton Axle Co., which recently commenced the erection of a plant in Cleveland. The Eaton works will become a unit of the Standard Parts Co., whose plants include those of the Standard Welding, Perfection Spring and American Ball Bearing companies, Cleveland; the Bock Bearing Co., Toledo; Cleveland Canton Spring and Cleveland Axle Mfg. companies, Canton, Ohio; Pontiac Spring Co., Pontiac, and Flint Spring Co., Flint, Mich.; Stearns Axle Works, Wheeling, W. Va., and the Arnsted Spring Works, Connersville, Ind.

The Toledo Milling Machine Co., Toledo, Ohio, has been formed to bring out a new line of milling machines and contemplates erecting a plant, 100 x 400 ft. John Geismar of the National Supply Co., Toledo, is president; L. J. Hinde of the Toledo Machine & Tool Co., vice-president; Paul Bateman, secretary and treasurer, and Herman Saxon, general manager.

The Cleveland Worm & Gear Co., Cleveland, contemplates the erection of a new machine shop.

The National Razor & Mfg. Co., Fremont, Ohio, has been organized to manufacture razors. H. D. Petty is president; W. H. Heyman, vice-president, and C. A. Ream of the Herbrand Co., secretary and treasurer.

It is announced that the Elgin Motors Co., Elgin, Ill., has practically closed a deal to acquire the plant of the Jewett Car Co., Newark, Ohio, and if concluded will move to that city.

The Napoleon Tool & Machine Co., Napoleon, Ohio, has been incorporated with a capital stock of \$40,000 to manufacture tools and machine parts. Fred Rits, J. J. Johnson, Henry F. Eggers and others are interested.

The State Foundry & Pattern Co., Akron, Ohio, will build a new foundry at 90 Elinore Street.

The James Maher, Pipe, Tongs & Wrench Co., Delaware, Ohio, will build an addition to its plant.

The Lorain Machine & Auto Co., Lorain, Ohio, has been incorporated with a capital stock of \$230,000 by P. S. Naylor, J. W. Regal and others and plans to manufacture machine and automobile parts and to engage in general machine work.

A site for the Ajax Rubber Co.'s plant at Sandusky,

Ohio, has been acquired and engineers are preparing to start construction.

#### Catalogs Wanted

The Turbine Air Tool Co., Cleveland, which has developed and is making a complete line of pneumatic tools, desires catalogs for its purchasing and engineering departments.

## Chicago

CHICAGO, Feb. 16.

Sellers report a falling off in inquiries and orders but regard it as a natural reaction after the heavy buying which occurred just before the recent price advances took effect. While general business has declined, the market is by no means stagnant. The Samson Tractor Co., Janesville, Wis., which has been purchasing steadily for several months, is still buying considerable equipment. The Chain Belt Co., Milwaukee, has issued a list, including two boring mills, a punch and shears, a drill press, an engine lathe and other miscellaneous machines. The Benjamin Electric Co. has bought tool equipment for its Des Plaines, Ill., plant, and the Automatic Electric Co., Chicago, has placed a number of orders. The Chicago Board of Education has revived a list of requirements for the Carl Schurz High School, including two motor-driven 13-in. x 5-ft. engine lathes, a light milling machine, two bench lathes, two bench drills, a sensitive drill, a 14-in. shaper, a motor-driven hack saw, etc.

The Monighan Machine Co., 2016 Carroll Avenue, Chicago, has asked for bids through an architect on the first unit of a manufacturing plant to be erected at Walton and Augusta streets. This will be a one-story structure, 110 x 504 ft., equipped with traveling crane, and will cost \$400,000.

The Olive Can Co., 1282 Clybourn Avenue, Chicago, is having plans drawn for a three-story and basement building, 72 x 120 ft., to be erected at North Leavitt and Ferdinand streets, at a cost of \$125,000.

Nelson & Le Moon, manufacturers of auto trucks, 849 North Kedzie Avenue, Chicago, are receiving bids on a two-story automobile assembly plant, 120 x 152 ft., at 847 North Troy Street, at a cost of \$60,000.

H. Kramer & Co., smelters, 1224 West Twenty-first Street, Chicago, have awarded contracts for the construction of a one-story foundry, 127 x 200 ft., two-story warehouse, 30 x 85 ft., and two-story office building, 58 x 65 ft., at Twenty-first and Loomis streets, at a cost of \$150,000.

The Johnson Fare Box Co., 236 South Robey Street, Chicago, has awarded a contract for the erection of a three-story, plant, 125 x 165 ft., at 4621-33 Ravenswood Avenue, to cost \$130,000.

P. J. Orbesen & Son, manufacturers of refrigerators and store fixtures, 1633 North Hamlin Avenue, Chicago, has asked bids on a two-story addition.

The National Tea Co., 2715 West North Avenue, Chicago, has let contracts for the construction of a one-story garage and repair shop, 100 x 145 ft., at 1022-30 Larrabee Street, at a cost of \$75,000.

The Devry Corporation, manufacturer of moving picture machines, 1248 Marianna Street, Chicago, has let a contract for the construction of a three-story plant, 83 x 200 ft., at 3507-25 North Racine Avenue, to cost \$90,000.

## Cincinnati

CINCINNATI, Feb. 16.

The New York, Chicago & St. Louis Railroad has issued a list comprising 28 machine tools, including lathes, planers, and other special machinery. This is the only large inquiry at present before the local trade. The Trailmobile Co. has completed the purchase of machine tools for its new plant at Oakley, but is still inquiring for eight electric hoists. The Pennsylvania Railroad has purchased several tools for its shops at Richmond and Mingo Junction. The King Machine Tool Co. has purchased eight shop cranes, and the Jarecki Chemical Co., Cincinnati, has purchased through the J. K. Nickerson Co. an 80-ft. span Shepard crane. Automobile and shipbuilding companies have also been in the market for tools, including the General Motors Corporation, National Shipbuilding Co., the Navy Department, and the American Car & Foundry Co. A number of tools were taken by English railroads for their car building plants. The Ordnance Salvage Board has disposed of 22 tools to the East Side High School, Cincinnati, and 11 to the University of Cincinnati. Business continues brisk, and while the recent flurry in foreign exchange created considerable discussion, manufacturers generally are very optimistic regarding the future of the machine tool industry.

The Cincinnati office of the Ordnance Salvage Board has disposed of the plant and equipment of the Southern Machine

Co. to a group of Chattanooga business men for \$500,000. The plan was constructed during the war and for a time was engaged in turning out shells for the Government. The building alone cost \$100,000.

The Hooven, Owens, Rentschler Co., Hamilton, Ohio, has booked an order from the Hamilton Furnace Co. for a blowing engine to cost about \$100,000. It is understood that this is to be used in connection with a second blast furnace which the company contemplates erecting in the near future.

The Karl Klefer Machine Co., Cincinnati, manufacturer of canning machinery, will erect a two-story brick and concrete building, 50 x 150 ft., on the north side of Martin Street, near Pearl. Elzner & Anderson are the architects.

The city of Hamilton, Ohio, has authorized an issue of \$650,000 in bonds for the construction of a municipal electric light plant. It is understood that as soon as the bonds are issued the equipment will be purchased and work commenced on the erection of the buildings.

Bids have been received by Morris Peterman, architect, Columbus, Ohio, for the construction of a factory, 50 x 125 ft., two stories, for the Newark Stamp & Foundry Co., Newark, Ohio. The estimated cost is \$30,000. The contract has not as yet been awarded.

Plans have been completed for the erection of a two-story building, 44 x 100 ft., for S. Wise & Sons, Dayton, Ohio, work to begin as soon as the weather permits.

The National Cash Register Co., Dayton, Ohio, Vice-president, J. H. Barringer, has in contemplation a building program covering the next four years to cost \$4,500,000. The first unit will be undertaken this year, and will cost in the neighborhood of \$1,250,000. Final details of the plan have not yet been worked out. J. H. Barringer is vice-president.

Plans for an addition to the plant of the Lima Locomotive Works, Lima, Ohio, have been completed and the directors have authorized the expenditure of \$400,000 on the project. Work will start immediately.

The Columbia Sanitary Mfg. Co., Louisville, Ky., has increased its capitalization from \$1,000,000 to \$3,000,000, and it is stated that additions to its plant are contemplated.

The Schmidt Brass Foundry Co., Columbus, Ohio, has been incorporated with a capitalization of \$10,000 to do a general brass foundry business. G. W., E. and G. M. Schmidt and C. V. Dehnhoff are the incorporators.

The Timken Roller Bearing Co., which has under construction a plant at Columbus, Ohio, has recently purchased a tract, 80 x 600 ft., and has taken out a permit for the construction of additional buildings to cost about \$500,000. Bids are being received.

The Standard Electric Tool Co., Cincinnati, has increased its capital stock from \$40,000 to \$75,000. It is understood new equipment will be purchased to increase its production of electric drills and grinders.

The Yates-Lahner Co., Covington, Ky., has been incorporated with a capital stock of \$28,000 by Raymond C. Yates, Charles Lahner and William A. Rabe. It will manufacture concrete products and will also operate a wood-working factory.

The Franklin Tractor Co., Greenville, Ohio, will purchase an extensive line of equipment for its new plant, now in course of construction, including lathes, shapers, boring mills, drill presses, etc.

#### Catalogs Wanted

The Cincinnati Automatic Machine Co., Oakley, Cincinnati, would like to receive catalogs from manufacturers of machine tools for its files.

## Detroit

DETROIT, Feb. 16.

The General Aluminum & Brass Mfg. Co., Detroit, has opened its branch plant in South Park, Port Huron, Mich. The buildings have been remodeled and enlarged and new machinery installed. It is expected that the output will be 50,000 castings a day.

The Industrial Foundry, St. Johns, Mich., is about to increase its capitalization to \$150,000 to care for expanding business and provide for necessary improvements.

By temporarily repairing the old plant, which was recently damaged by fire, the Melling Forging Co., Lansing, Mich., has been able to resume production. Production will be shifted to a new addition, to be completed in 30 days. The old plant will be rebuilt.

The Handley-Knight Co., Kalamazoo, Mich., recently organized to manufacture automobiles, has acquired about 40 acres and has plans under way for the erection of a plant with initial capacity of about 25 cars a day. J. D. Handley heads the company.



The Lufkin-Rule Co., Hess Avenue, Saginaw, Mich., manufacturer of rules, steel tapes, etc., is having plans prepared for a one-story addition, 115 x 120 ft., at Hess Avenue and Prescott Street, to cost about \$100,000, including equipment.

The Automobile Crank Shaft Co., 192 Piquette Avenue, Detroit, is planning for the immediate construction of a one-story addition, 40 x 165 ft.

## Indianapolis

INDIANAPOLIS, Feb. 16.

The Karges Wagon Works, Morgan Avenue, Evansville, Ind., has had plans prepared for two one-story additions, 64 x 200 ft. and 65 x 75 ft. Clarence Karges is manager.

The General American Tank Car Corporation, Calumet, Ind., has arranged for an issue of trust certificates aggregating \$2,625,000. In addition to its local plant, the company is operating plants at Warren, Ohio, and Sand Springs, Okla., with total capacity of about 50 cars daily.

The Western Drop Forge Co., Marion, Ind., will soon commence the erection of a one-story addition, 70 x 200 ft.

The Milholland Machine Co., West Twenty-third Street and Belt Line Railroad, Indianapolis, manufacturer of screw machines, lathes, etc., has awarded a contract to the H. K. Ferguson Co., Euclid Avenue, Cleveland, for the erection of a machine shop and general manufacturing works, each one-story, to be known as unit No. 1 and No. 2, respectively. W. K. Milholland is president and general manager.

The Spacke Machine & Tool Co., Indianapolis, plans to increase the production of its light weight automobiles to 100 per day from the present output of about 20 a day. The production of axles will be increased to about 200 sets a day. The working force will be increased from 600 to 1000. Plans are now being prepared for a new factory on a 23-acre site at Oliver Avenue and the Belt Railroad.

The Indiana Foundry Co., Muncie, Ind., has let contracts for the construction of a new plant to cost in the vicinity of \$75,000. The main building will be of steel, 150 x 200 ft. H. B. Hartley and H. B. Harvey, owners of the Eagle Foundry Co., are the chief stockholders in the new concern.

The Ames Shovel & Tool Co., Boston, Mass., has purchased ground at New Albany, Ind., where it will erect a branch plant, adjoining the foundry of Gohmann Brothers & Kahler.

The John Lees Co., Indianapolis, manufacturer of special machinery and tools, has acquired a 99-year lease of the former plant of the Diamond Chain & Mfg. Co., at Georgia Street and Senate Avenue.

The Metal Basket Works, Lafayette, Ind., has been incorporated with \$100,000 capital stock. The directors are W. S. Crum, W. F. Sheets and J. F. Bellinger.

Sunbeam Electric Mfg. Co., Evansville, Ind., has increased its capital stock to \$275,000.

The Peru Brass & Mfg. Co., Peru, Ind., has been incorporated with \$50,000 capital stock. The directors are Ernest and Oscar Theobald and John J. Knott.

The Portland Body Works Co., Portland, Ind., has increased its capital stock from \$150,000 to \$200,000.

The Hoosier Ice Machine Works, Evansville, Ind., has been incorporated with \$15,000 capital stock to manufacture refrigerating and ice making machinery. The directors are A. B. Alexander, G. A. Condit and M. P. Alexander.

The Muncie Machine Tool & Supply Co., Muncie, Ind., has changed its name to the Muncie Machinery & Supply Co.

## Texas

AUSTIN, Feb. 16.

The R. A. Toombs Sash & Door Co., Fort Worth, has been incorporated with a capital stock of \$350,000, and plans to build a factory. The incorporators are R. A. Toombs, J. M. Thompson and W. R. Thompson.

The Al-Tex Refining & Holding Co. has purchased a 20-acre tract at Stephenville upon which it will construct a refinery with a daily capacity of 2500 bbl.

The Lone Star Steel & Bridge Works, Houston, has been incorporated with a capital stock of \$100,000 to build a plant for the manufacture of structural steel and bridge materials. George E. Cole of Houston is president.

The City Council, Brownwood, has appropriated \$50,000 for the construction of a municipal electric light plant.

S. F. Bowser & Co., manufacturers of oil and gasoline tanks, with headquarters at Fort Wayne, Ind., have purchased a factory site at Dallas, and will erect a building 120 x 150 ft., one story, to cost about \$50,000. The equipment will cost an additional \$50,000, it is stated.

The Pa-Tex Petroleum Co., has purchased 130 acres ad-

jacent to Wichita Falls which it will use as a site for a refinery with a daily capacity of 1500 bbl. G. E. Wilson, Wichita Falls, is president.

The White Oil Corporation, New York and Houston, will begin the construction of a 15,000-bbl. oil refinery at Texas City about March 1. It is laying an 8-in. pipe line from the Mid-Continent and north Texas fields to Texas City.

The Caldwell Electric Power & Ice Co., Caldwell, will install a new 100-hp. engine and other equipment in its electric light and power plant.

The Keen & Woolf Refining Co., Beatty Building, Houston, is having plans prepared for the erection of a new plant near Clinton. The works will comprise several buildings and are estimated to cost \$300,000.

The A. L. Jones Machine Co., Coleman, Tex., is planning for the establishment of a new machine shop. A building has been acquired and necessary machinery will be purchased, including lathes, drill press, steam hammer, etc., to handle oil field equipment construction and repairs. A. L. Jones is president.

The Whitesboro Oil & Refining Co., Sherman, Tex., has had plans prepared for a new plant.

The Harak Conveyor Mfg. Co., Houston, is planning for the installation of new equipment at its machine works on McKinney Street, including lathes, milling machine and other apparatus.

The United States Producers' Refining Co., Shreveport, La., has plans under way for the erection of a refinery near Wichita Falls, Tex. In addition to the main plant, five casing-head gasoline plants and two absorption plants will be constructed, as well as extensive pipe lines, loading facilities, etc. The project is estimated to cost in excess of \$25,000,000. E. W. Hartman is president.

The Abilene Gas & Electric Co., Abilene, Tex., has completed plans for the erection of a new electric generating plant to cost about \$110,000.

The S. C. Creech Co., Bay City, Tex., will build a one-story works, 50 x 140 ft., for the manufacture of tractor parts and other motor products.

The Farmers' Gin Co., Deport, Tex., recently organized, has plans under way for the erection of a plant, with daily capacity of 100 bales of cotton. The equipment is estimated to cost about \$30,000. William Hammond is manager.

## The Central South

LOUISVILLE, Feb. 16.

The Byron Engineering Co., Louisville, Ky., incorporated a few months ago to manufacture trailers for trucks, has placed a contract with C. A. Koerner & Co., Louisville, for a building to cost \$24,000, at Fourteenth and Hill streets. Temporary quarters are at 911 Columbia Building.

The Inman Veneer & Panel Co., Louisville, is considering plans for equipping a private power plant and has announced plans for the installation of \$35,000 worth of additional wood-working machinery for a new core plant.

The Springfield Sprayer Distributing Co., Louisville, capital stock \$100,000, has been incorporated by J. M. Buckner and others to manufacture sprayers for trees, etc.

Announcement has been made by the O. K. Stove & Range Co., Louisville, of additions costing \$60,000, including a new molding plant, and a six-story building.

The Francke-Hicks Bedding Machine Co., Louisville, capital \$6,000, has been incorporated to manufacture machinery for making baling presses, and wood and iron novelties.

The Perfect Projection Shutter Co., Louisville, has been incorporated with a capital stock of \$20,000 by Virgil Winters and others, to manufacture metal shutters for moving picture machines.

The Columbia Sanitary Mfg. Co., Louisville, manufacturer of sanitary plumbing goods, has increased its capital stock to \$300,000, and will double the capacity of its plant.

The Fehr Cold Storage Co., Louisville, will build a cold storage plant at a cost of \$850,000.

Warren C. Callahan, Callahan & Sons, Louisville, is president of the Dixie Belle Refinery Co., which has purchased a site on the Ohio River for an oil refinery to cost \$250,000.

The Columbia-Panama Coal Co., 540 State-Lake Building, Chicago, will equip a power plant and make purchases for coal mining operations at Manchester, Ky.

The United Casket Co., 501 Kentucky Title Building, Louisville, Ky., has purchased the block between Twelfth and Thirteenth streets, Magnolia and Burnett avenues, on the line of the Kentucky & Illinois Terminal Railway, and will shortly begin the construction of a factory, 100 x 460 ft., and boiler house of the monitor type of re-enforced concrete. The remainder of the machinery to be installed will

be purchased shortly. The heating system has not yet been purchased. Gerard E. Zimmerman is president.

The Standard Oil Co., 424 West Bloom Street, Louisville, has plans under way for the erection of additions to its refinery at Riverside Station, to double the present capacity. The project, including machinery, is estimated to cost about \$1,500,000.

## The Pacific Northwest

SEATTLE, Feb. 10.

Manufacturers of marine and sawmill equipment are rushed with orders. One large engine company in Seattle reports orders coming from Alaska, the Philippines, China, and even Eastern points. The car shortage is still acute, but with a slight improvement lumber manufacturers are planning to increase their operations. It is estimated that fully 50 per cent of the business offered has been refused, on account of the scarcity of cars.

The Hardesty Mfg. Co., Penticton, B. C., plans the erection of a plant for the manufacture of metal flume. It recently secured a \$30,000 contract from the Provincial Government.

Russell & Irwin, Spokane, contemplates the erection of a fertilizer plant at Maxwell, Mont., to cost between \$250,000 and \$300,000. It will have a daily capacity of 500 tons.

The Standard Rotary Rod Weeder Co., Helena, Mont., plans the erection of a factory for the manufacture of farm machinery. T. C. Theinhardt is vice-president and manager.

The Welded Steel Tank Co., Seattle, has purchased the plant of the Pacific Products Co. at 4806 Eighth Avenue South, which it will enlarge and improve. The company specializes in welding steel tanks, but is also equipped for the manufacture of electric welded hydraulic pipe.

The Enterprise Foundry Co., Juneau, Alaska, plans the installation of a new brass furnace, with 1500 lb. capacity.

The Union Oil Co. has purchased a site at Edmonds, Wash., on which will be erected an oil distributing station. Four 55,000 gal. steel tanks will be erected.

## Canada

TORONTO, Feb. 16.

The Canadian Nathan, Ltd., has completed plans for the establishing of a plant in Hamilton, Ont., and backed by a number of leading Canadian and American industrial interests, it is stated, will take over the works of the Canadian Chadwick Metal Co., Ltd. The entire plant will be remodeled and equipped to manufacture brass and metal specialties, including the line of Nathan injectors, ejectors, lubricators, boiler chucks, valves, etc., for locomotives, marine and stationary boilers. It will also carry on a general brass foundry business. The company will be closely associated with the Nathan Mfg. Co. of New York. The directors of the Canadian concern include J. W. Norcross, F. S. Isard and W. J. Carrigan, Montreal; M. S. Tooth and Alfred Nathan, New York; W. W. Chadwick, George Guy and W. R. Dunn, Hamilton, and C. Secord, Toronto. J. W. Norcross is president; E. S. Tooth, vice-president; W. J. Carrigan, managing director; and R. F. Curtis, secretary-treasurer.

The Canadian General Electric Co. will spend between \$600,000 and \$1,000,000 on new buildings and equipment at Peterboro, Ont., construction to begin in June. The company is asking the city for a ten-year extension of its present fixed assessment of \$150,000. Frederick Nicholls is head of the Canadian company.

The Wood Hydraulic Hoist & Body Co., Detroit, Mich., will build a plant at Windsor, Ont., in the spring. Plans have not yet been completed, although it is understood that two buildings will be erected, one for manufacturing hydraulic hoists and the other for truck bodies, etc.

The Star Specialty Co., Ltd., 661 Queen Street, East, Toronto, Ont., is in the market for an 18 or 20-in. shaper.

The Canadian Pacific Railway Co. will spend \$1,000,000 on improvements at Weyburn, Sask. J. McKenzie, Winnipeg, is western chief engineer.

The Saguenay Co. will build a sawmill at Chicoutimi, Que., to cost \$40,000. William Blanchette is manager and J. A. Clareau is architect.

The Hull Iron & Steel Works, Hull, Que., will build a foundry addition to its plant. A. H. Coplan is president and Millson & Burgess, 208 Sparks Street, Ottawa, Ont., are the architects.

Plans are being prepared for an auto truck factory for Barton & Rumble, 596 Hamilton Road, London, Ont., to cost \$10,000. Construction will start about April 1.

The Gillette Safety Razor Co. of Canada, 77 St. Alexander Street, Montreal, plans additions and alterations to its factory. King C. Gillette is president and Frank J. Fahey is treasurer.

The Lignite Utilization Board, 2 Youville Square, Montreal, is calling for bids for material and the erection of buildings at its plant at Estevan, Sask. The work includes office and laboratory, 20 x 50 ft.; car house, 16 x 44 ft.; crusher building, 15 x 20 ft.; dryer building, 40 x 80 ft.; carbonizer building, 55 x 84 ft.; briquette building, 42 x 55 ft.; power house, 48 x 100 ft., etc. Tenders must be in by March 6. Leslie R. Thompson is secretary, and R. A. Ross chairman of the board.

The Canada West Electric Co., 1221 Osler Street, Regina, Sask., will spend about \$40,000 on improvements to its plant. E. B. Murphy is manager.

James Russell, architect, Downie Street, Stratford, Ont., will prepare plans for the erection of a boiler house in which will be installed a 250-hp. boiler for the Kindel Bed Co., Ontario Street, Stratford. Mr. Jones is the superintendent.

The Canadian Stewart Co., Toronto, has the general contract for the erection of a factory and power house at Windsor, Ont., to cost \$250,000 for the Borroughs Adding Machine Co., Piquette Avenue, Detroit.

The Town Council, Yorkton, Sask., is contemplating the erection of a power plant to cost \$200,000. F. J. Pilkington is clerk.

The Galt Brass Co., Galt, Ont., has had plans prepared for an addition to its plant, including a new brass foundry, 58 x 138 ft. Construction will begin as soon as weather permits.

It is stated that the plant of the Canadian Steel Foundries, Welland, Ont., will shortly resume operation. It was closed last summer owing to lack of business. Recently control in the Canadian Steel Foundries was purchased by American interests.

The Machinery & Supply Sales Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of \$50,000 by David T. White, Daniel L. McIntyre, George W. Bailey and others to manufacture machinery, engines, boilers, etc.

The Wonderphone, Ltd., Vancouver, B. C., has been incorporated with a capital stock of \$1,000,000 by Roy G. Shrader, George E. Hancox, Frederick R. Anderson and others to manufacture telephone and telegraphic instruments, machinery, etc.

The Forster Motor Car & Mfg. Co., Ltd., Montreal, has been incorporated with a capital stock of \$1,000,000 by Thomas R. Sloan, Stanley H. Slater, Samuel C. Arrell and others all of Hamilton, Ont., to manufacture automobiles, trucks, engines, motors, machinery, etc.

The Gotfredson-Joyce Corporation, Ltd., Ford City, Ont., has been incorporated with a capital stock of \$100,000 by Benjamin Gotfredson and Mark H. Coleman, both of Detroit, Frank H. Joyce, Ford City, and others to manufacture automobiles, trucks, parts, etc.

The Monarch Tractor Sales, Ltd., Brantford, Ont., has been incorporated with a capital stock of \$100,000 by Harold Potts, Wilfred G. Wyllie, Frank Johnston and others to manufacture farm tractors, tools, etc.

## OFFICE CHANGES

The Electrolabs Co. has decided to consolidate all its offices at 2635 Penn Avenue, Pittsburgh. For the convenience of its clients it will maintain a branch office at room 313, 30 Church Street, New York.

The Hammond Steel Co., Inc., Syracuse, N. Y., has moved its Detroit office from 912 Kresge Building to 207 Scherer Building. S. M. Wetmore is district sales manager.

The W. T. Price Engineering Co., designer of steel plants and foundries, is moving its main office to Philadelphia and its drawing room to New Brunswick, N. J. Temporarily, until necessary accommodations can be obtained in Philadelphia, the main office will be in New Brunswick. The company will, however, maintain a small sales office in the Woolworth Building, New York.

The Wenger, Armstrong Petroleum Co., Chicago, has opened an office at Dallas, Tex., in the Southwestern Life Building, to take care of its Southwestern export trade. The office is in charge of J. J. Jenkins, well known among the oil trade in the midcontinent field and Chicago.



## NEW TRADE PUBLICATIONS

**Threading Tools.**—Geometric Tool Co., New Haven, Conn. Catalog, 96 pages, 4 x 7 in. Illustrates and describes a line of self-opening and adjustable die-heads, solid adjustable die-heads, collapsing taps, chaser grinder and threading machine. The adjustable die-heads and collapsing taps are made in a number of styles, each specially designed to meet certain requirements. A number of useful formula, tables of screw threads, and decimal equivalents are included.

**Switches and Wiring Material.**—John J. Leahy, 48 Dey Street, New York. Catalog "P," 183 pages, 4 1/4 x 6 in. Lists and illustrates an extensive line of "H&H" switches, and "Palste" wiring materials.

**Steam Turbine Blading.**—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin 1104. Describes the successive steps and processes in the development of the company's methods used in the manufacture of steam turbine blading. The swaging method of securing the blades, the channel shroud protection, the brazed lacing strip, the method followed in brazing the channel shrouds to the tips of the blades, and the company's patented process for casting the foundation rings around the ends of the blades are described. Numerous photographs supplement the text.

**Grinding Wheels.**—Abrasive Co., Philadelphia. Booklet. Lists and describes abrasive grinding wheels made of boron, also electroboron. These wheels are made by four different processes of manufacture—vitrified, silicate, elastic, and rubber.

**Cleveland System of Punches.**—Cleveland Punch & Shear Works, Cleveland. Catalog, with the title, "The Cleveland System," which is explained as an "economical system of punches." By the use of sleeves, various diameters of holes can be punched with the same nut and punch stem. The system is illustrated and described.

**Cylindrical Grinding.**—Norton Grinding Co., Worcester, Mass. Booklet, 34 pages, 6 x 9 in. Principles of cylindrical grinding are discussed by Charles H. Norton and grain depth of cut by George I. Alden. The text is supplemented by numerous illustrations.

**Lead Burners' Outfits.**—Davis-Bournonville Co., Jersey City, N. J. Descriptions with illustrations of lead burners outfits for welding lead sheets, storage battery connections, lead pipes, chemical apparatus and other lead work.

**Concrete Chimneys.**—Portland Cement Association, 111 West Washington Street, Chicago. Booklet. Shows views and gives statistics on tall concrete chimneys built for various concerns.

**Mechanics' Tools.**—Crescent Mfg. Co., 129 Reade Street, New York. Catalog of mechanics' tools manufactured for the jobbing trade.

**Steel Bending Brakes.**—Dreis & Krump Mfg. Co., 2909 South Halsted Street, Chicago. Catalog 19. Illustrates and describes an extensive line of steel hand bending brakes, steel box and pan brakes, steel power bending brakes and special brakes.

**Magnesite.**—Northwest Magnesite Co., Crocker Building, San Francisco. Booklet. Gives information about the history, manufacture, use and properties of refractory magnesite. The booklet is illustrated.

**Gas Mask.**—Gasco Protector Co., 7216 Ridge Boulevard, Chicago. Pamphlet. Describes an aluminum and rubber protector for the protection of employees while working in gases, smoke or dust. A mask fits over the mouth, nose and eyes, and is supplied with fresh air through a valve controlled flexible tube, while the exhaled air passes from the mask through a valve port.

**Ball Bearings.**—Gurney Ball Bearing Co., Jamestown, N. Y. Bulletin. Gives specific instances, with illustrations, of the use of ball bearings in machine design.

**Operator's Handbook for Blanchard Grinders.**—Blanchard Machine Co., 64 State Street, Cambridge, Mass. Booklet, 61 pages, 5 1/2 x 7 1/4 in. An operator's handbook for the Blanchard high-power vertical surface grinder, sizes 10 and 16. Chapters cover the care of the machine; operating instructions, which include chucking work, use of magnetic chuck, selection of wheels, mounting wheels, truing and dressing, sizing work and work-handling methods; adjustments and repairs.

**Cutting Tools.**—Alfred Herbert, Ltd., 54 Dey Street, New York. Bulletin 51. Reprints of three articles as follows: Cutting tools, which discusses the design of lathe, planer, shaper and slotter tools; standard cutting tools, which deals with the practical side of the subject of cutting tools, their selection, use, manufacture, etc.; the tool-making de-

partment, which gives arguments in favor of internal specialization in the production of cutting tools, with suggestions regarding the equipment of a tool-making department. The bulletins are illustrated.

**Heat-Treatment Handling Devices.**—W. S. Rockwell Co., 50 Church Street, New York. Leaflet 207. Illustrates and describes handling devices in use with twin-chamber underfired heat-treating and carbonizing furnaces. These include a charging machine, charging rig, trucks for handling carbonizing parts on boxes, and table and special fork for charging and removing material.

**Engineering Service.**—Service Engineering Co., 25 Church Street, New York. A 31-page booklet which explains the company's organization and presents facilities for engineering service covering the fields of consulting, plant and machine tool appraising, planning, complete tooling systems, design and building of tools, special and automatic machinery, and the development of inventions.

**Treads and Mats.**—Philip Carey Co., Lockland, Cincinnati. Folder. Illustrates and describes flexible mats and treads to be placed on wood or concrete floors where workmen stand at machines or benches, thus to provide an insulation from dampness and cold.

**Pressure Regulating Devices.**—Mason Regulator Co., Boston. Catalog 60, 216 pages, 4 1/2 x 6 1/2 in. Concerned with an extensive line of reducing valves, pump regulators, balanced valves and draft regulators. The devices are illustrated.

**Centrifugal Pumps.**—Allis-Chalmers Mfg. Co., Milwaukee. Bulletin. Lists a line of three-phase, 60-cycle, motor-driven type "S" centrifugal pumping units which the company has in stock.

**Hydraulic Cocoa Presses.**—Fred S. Carver, 8 West Fortieth Street, New York. Illustrations and descriptions of hydraulic machinery for chocolate and cocoa factories, including a hydraulic cocoa press and an accumulator system for operating cocoa presses.

**Standardized Gears.**—Boston Gear Works, Norfolk Downs, Mass. Catalog F-9. Specifications of an extensive line of standardized stock gears made in various sizes, also socket chains, universal joints and ball bearings. The articles are illustrated.

**Health Bulletin.**—Norton Co., Worcester, Mass. Booklet. Presents the causes and remedies of troubles common among men doing shop work, gives suggestions for the prevention of these troubles and encourages the maintenance of sanitary conditions in the shop and home.

**Lane Electric Cranes.**—N. B. Payne & Co., 25 Church Street, N. Y. Bulletin. Illustrates and describes several styles of cranes in which steel girders or heavy timbers of long leaf yellow pine are used. These cranes are made by the Lane Mfg. Co., Montpelier, Vt. They were described in THE IRON AGE, issue of Dec. 4, 1919, page 1124.

**Condensers, Pumps, Cooling Towers.**—Wheeler Condenser & Engineering Co., Carteret, N. J. Bulletin 112-B. 36 pages, 8 x 10 1/2 in. Concerned with condensers, pumps, cooling towers, etc. Photographs are shown of a surface condenser containing 50,000 sq. ft. of surface, surface condensers, jet condensers, barometric condensers, air pumps, rotative dry vacuum pumps, turbo-air pumps, steam jet air pumps, centrifugal pumps for various services, natural and forced-draft cooling towers, feed water heaters, evaporators and dryers, etc.

**Steam Ash Conveyor.**—American Steam Conveyor Corporation, 326 W. Madison Street, Chicago. Folder, with the title "A Yard of Installations." Nineteen views of installations of the company's steam ash conveyor.

**Baffles for Water Tube Boilers.**—Betson Plastic Fire Brick Co., Inc., Rome, N. Y. Folder. Illustrates and describes one-piece permanent baffles for water tube boilers. They are made in new or old boilers without disturbing the settings by using wooden slates which are laid between the tubes and the space formed rammed full of plastic fire brick.

**Brass Founders' Supplies.**—Brass Founders' Supply Co., Newark, N. J. Catalog 15, 69 pages, 6 x 9 in. Deals with extensive equipment and supplies for brass, bronze, aluminum, iron and steel foundries. The items include flasks, sprue saws and sprue cutters, tumblers, wheel brushes, sand blast machines, melting furnaces, black lead crucibles, etc. Tables give melting points, tensile strength, and constituents of various mixtures for brass, copper and aluminum.

**Pressure Volume Indicator, Pilot Tubes and Orifices.**—Bacharach Industrial Instrument Co., Pittsburgh. Two pamphlets. Pamphlet P illustrates and describes Pilot tubes and orifices for measuring the flow of gases in connection with hydro flow meters. Pamphlet F deals with a pressure volume indicator for the control of air delivery to cupolas and suitable for either permanent installations or testing purposes.





